iSBC 680/681™ MULTISTORE™ USER SYSTEM PACKAGE HARDWARE REFERENCE MANUAL

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PREFACE

This manual provides general information, installation and setup instructions, and service information for the iSBC 680/681 Multistore Chassis. Additional information on related Intel topics is provided in the following publications, available from the Literature Department:

- *Intel MULTIBUS Specification,* Order No. 980683.
- *Intel MULTIBUS Interfacing,* Application Note AP-28A.

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CHAPTER 1
GENERAL INFORMATION

1-1. INTRODUCTION

The iSBC 680/681 Multistore Chassis is a complete MULTIBUS system enclosure. Each chassis is equipped with a six-slot Multibus compatible cardcage, 300-watt switching power supply, two peripheral slide mounts, and a front panel with switches and indicators. The user can then provide a wide range of peripherals and Intel single board products for use within the chassis.

This manual provides the information you will need to install and operate either the iSBC 680 or 681 chassis. Service information is included in Chapter 4.

1-2. DESCRIPTION

The iSBC 680 Multistore Chassis is the table-top version, and the iSBC 681 Multistore Chassis is the rack-mounted version.

Both the iSBC 680 and the iSBC 681 Multistore Chassis utilize a high-efficiency switch power supply with six output voltages. The six regulated DC voltages are: +5, -5, +12, -12, +24 and -24 volts. The iSBC 680 also provides power fail interrupt, automatic restart after power-on, and real-time clock signal outputs.

All frequently used controls and indicators are mounted on the front of the chassis. These include an AC power ON/OFF switch, a RESET switch, an INTERRUPT switch, and two machine status indicator lamps.

The remainder of the chassis consists of a six-slot cardcage with Multibus backplane assembly, internal wiring, locations for two standard 8-inch peripheral devices, and removable filler panels. The Multibus backplane is equipped with six 86-pin connectors for accepting standard Intel iSBC boards. One 60-pin auxiliary connector (J10) is provided for additional Multibus signals which are routed through connector P2 on some Intel single board computers.

The chassis cooling system uses DC fans which draw air through the chassis and force air through the power supply.

1-3. DOCUMENTATION AND EQUIPMENT SUPPLIED

The iSBC 680/681 Multistore Chassis is shipped from the factory with an accessory kit.

Each iSBC 680 chassis consists of the following equipment: power supply, cardcage, front panel with switches and indicators, removable bottom, top and side panels, sliding mounts for the attachment of 8-inch peripherals, 2 front filler panels, cooling fans located within the power supply, and a 115 VAC power cord.

The iSBC 681 chassis is identical to the iSBC 680 chassis, except the front panel supplied is wider and rack-mount brackets are provided.

1-4. USER SUPPLIED EQUIPMENT

In most applications additional equipment will be required for operation. Typically, this equipment includes:

a. Any standard 8-inch peripheral device, such as floppy disk drives or Winchester type disk drives, which can be installed on one of two mounts provided.

b. Multibus compatible printed circuit boards which can be installed in the cardcage (refer to Paragraph 2-12).

c. A replacement AC line cord, if your AC line outlet is not compatible with the 115 volt cord supplied. Alternatively, you may want to replace only the male plug on the supplied cable.

d. RETMA rack-mounting screws and washers, if you are installing the chassis into a standard RETMA 19-inch enclosure (refer to Paragraph 2-8).

e. Additional auxiliary 60-pin connectors for the iSBC boards which require use of connector P2 (refer to application note AP-28A).

1-5. MULTISTORE CHASSIS SPECIFICATIONS

Specifications of the iSBC 680/681 Multistore Chassis are provided in Table 1-1.

Table 1-1. Specifications

PHYSICAL CHARACTERISTCS:	
Width:	16.75" (42.55 cm) Chassis dimension without front bezel 16.86" (42.83 cm) iSBC 680 front bezel 18.98" (48.21 cm) iSBC 681 front bezel
Length:	21.0" (53.34 cm)
Height:	12.25" (31.15 cm)
Weight:	40 lbs. (18.14 Kg) w/o accessories
BOARD SLOTS:	
	6 on 0.625 inch centers; one slot (J6) accepts Intel iSBX multimodule equipped host boards without slot penalty.
PERIPHERAL POSITIONS:	
	2 for devices measuring 8.55 inches x 14.25 inches x 4.65 inches, each.
ELECTRICAL CHARACTERISTICS:	
Input Voltages:	88 to 126 Vac or 176 to 252 Vac
Input Frequency:	47 to 66 Hz
Output Line Variation with Input Line & Load Variation:	±0.2% if input remains within specified limits.
Maximum Power Available:	300 Watts over all voltages cumulative.
Maximum Power Consumption:	550 Watts 5.0 Amps @ 110 Vac or 2.5 Amps @ 220 Vac
DC Output Overvoltage Protection:	25% over nominal
DC Output Current Limiting:	25% over maximum
Output Voltage Change per Temperature Change Coefficient:	±.03% per degree Celsius over operating range 0° to 40°C.
Periodic & Random Deviation (PARD) @ 20 Hz to 20 MHz:	50 millivolts p-p at ±5 VDC 100 millivolts p-p at 1±12 VDC & ±24 VDC
Efficiency:	Up to 60%
AC Power-Fail Signals:	PFIN/ & MPRO/
AC Power Failure Level:	88 VAC for 115 VAC systems 176 VAC for 220 VAC systems
+5 VDC retained at ±5% of its specified value after AC line voltage failure:	16 milliseconds minimum
PFIN/ to MPRO/:	8 milliseconds minimum
DC voltages reach ±5% of their specified values from cold start:	7 seconds maximum
ENVIRONMENTAL CHARACTERISTICS:	
Ambient Air Intake Temperature Range:	10° C to 35° C operating
Humidity:	20% to 80% non-condensing

NOTE

The system chassis and power supply conform to UL specification 114, CSA specifications 22.2 and #143 and IEC specification 435.

CHAPTER 2
PREPARATION FOR USE

2-1. INTRODUCTION

This chapter provides installation information, connector information and other setup instructions for the iSBC 680/681 Multistore Chassis. The user should read the entire chapter before applying power to the chassis and attempting operation.

2-2. UNPACKING AND INSPECTION

Inspect the shipping carton immediately upon receipt for evidence of mishandling during shipment. If the shipping carton is severely damaged or water-stained, request the carrier's agent be present when you open the carton. If the agent cannot be present when you open the carton, be sure to save all the packing materials. The agent may also request photos of the equipment as it was unpacked.

For repairs to a product damaged in shipment, contact the Intel Repair Center to obtain a Return Authorization Number. This procedure is described in Paragraph 4-2.

2-3. INSTALLATION CONSIDERATIONS

Before attempting to install the iSBC 680/681 Chassis, evaluate the potential site to ascertain the following requirements are met.

a. Power requirements, refer to Table 1-1.

b. Cooling requirements, refer to Paragraph 2-6.

c. Physical dimensions, refer to Paragraph 2-7.

d. Rack mounting requirements, refer to Paragraph 2-8.

2-4. POWER SPECIFICATIONS

The iSBC 680/681 Multistore Chassis power requirements are listed in Table 1-1. Each chassis may provide up to 300 watts of output power among the six voltages. Typically, this rating will more than satisfy the power requirements of six fully loaded Intel iSBC boards. The iSBC 680/681 power output specifications are listed in Table 2-1.

NOTE

All user supplied options should not use more than 300 watts DC, cumulative for all voltages supplied.

Table 2-1. Power Supply Output Specifications

12-Pin Connectors	Voltage/Signal	Current	Ripple*
1	MPRO/ (Memory Protect)		
2	-12 Volts	3.0 Amps**	100 mv
3	+12	2.9 **	100
4	RTC/ (Real Time Clock)		
5	+5 Volts	25.0 Amps	50
6	GND		
7	PFIN/ (Power Fail Interrupt)		
8	+5 Volts	5.0 Amps	50
9	GND		
10	-5		
11	+5		
12	GND		

9-Pin Connectors	Voltage/Signal	Current	Ripple*
1	-12 Volts	3.0 Amps**	100 mv
2	+12	2.9 **	100
3	+24	7.8 ***	100
4	+ 5	25.0	50
5	GND		
6	-24	1.6 ##	100
7	+ 5	5.0	50
8	GND		
9	- 5	2.0	50

* Peak to Peak
** 100 millisecond surge to 6.25 Amps
*** 100 millisecond surge to 12.2 Amps
100 millisecond surge to 3.2 Amps

NOTE:
These DC power specifications are given for all ouputs. Maximum power available over all voltages is 300 watts.

2-5. AC LINE VOLTAGE SELECTION

The power supply is configured at the factory for 115 VAC operation.

If you are located in an area which uses 220 VAC, the power supply must be reconfigured to accept this voltage. The input voltage conversion is a simple jumper reversal procedure.

WARNING

Hazardous voltages are present within the iSBC 680/681 whenever the power cord is connected. Disconnect the AC power cord from the chassis before attempting to service the power supply.

Input voltage conversion procedure:

a. Turn AC power switch OFF.

b. Remove power cord, if installed.

c. Remove power supply from the iSBC 680/681 chassis using the following steps:

   1. Detach all DC cables on front panel of power supply, see Figure 2-1.
   2. Unscrew the six retaining screws on the back of the iSBC 680/681 chassis, see Figure 2-2.
   3. Slide power supply out the back of the chassis, lay the power supply on its back with the AC cable opening in the power supply facing toward the chassis.

d. Remove power supply jumper cover, see Figure 2-1.

e. Remove "115 Volt" jumper. Turn the jumper plug 180 degrees and re-install as the "220 Volt" jumper, see Figure 2-3.

f. Ensure that all other connections in this area have not been disturbed during the conversion.

g. Replace power supply jumper cover.

h. Install power supply in chassis:

   1. Slide power supply into back of chassis.
   2. Attach by inserting the six retaining screws.
   3. Attach all cables to front of the power supply.

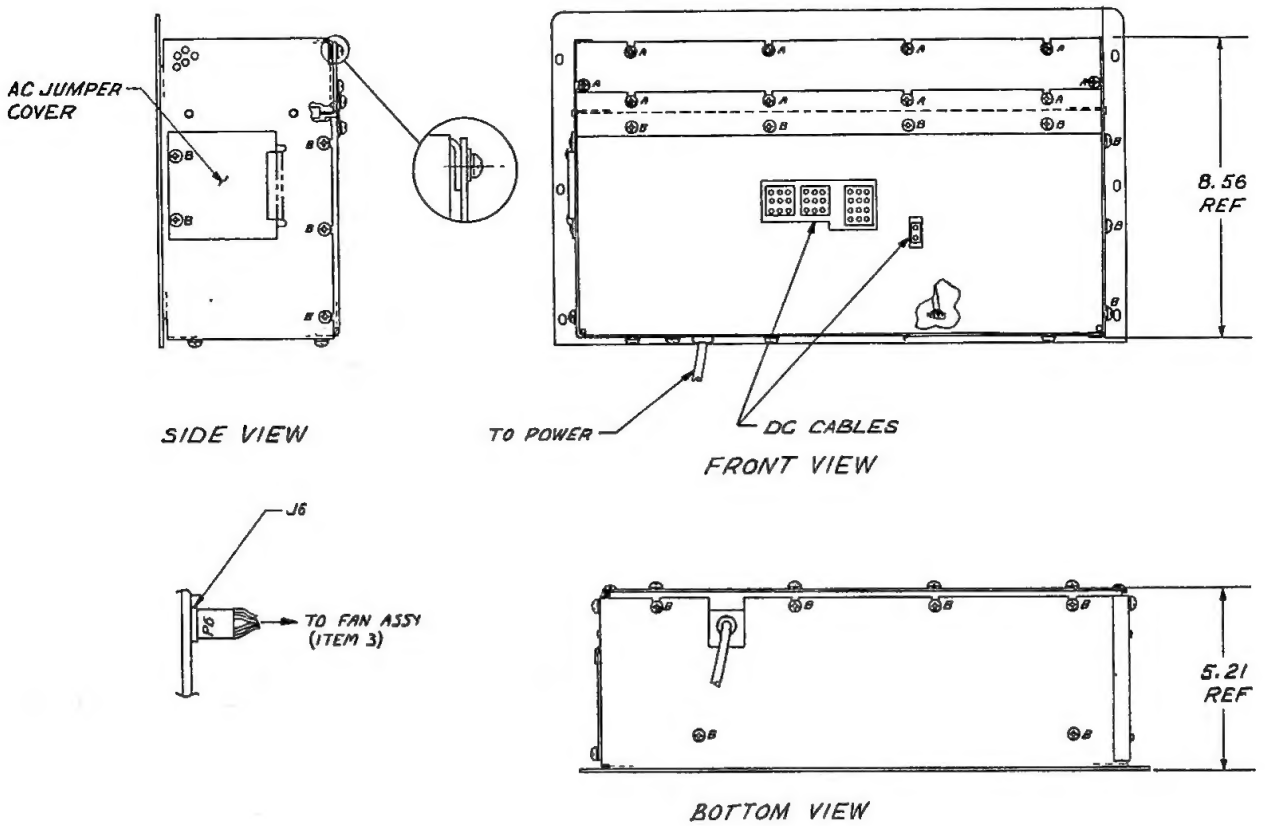


Figure 2-1. Power Supply Assembly Diagram

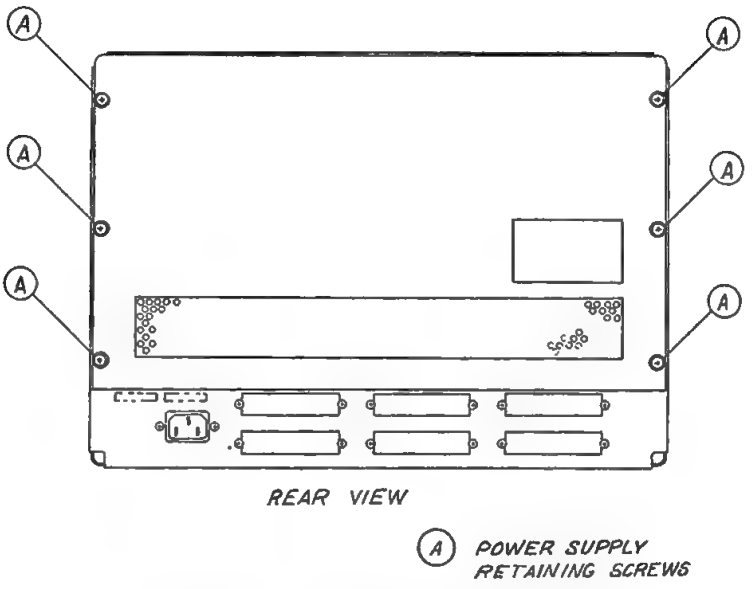


Figure 2-2. iSBC 680/681 Rear View

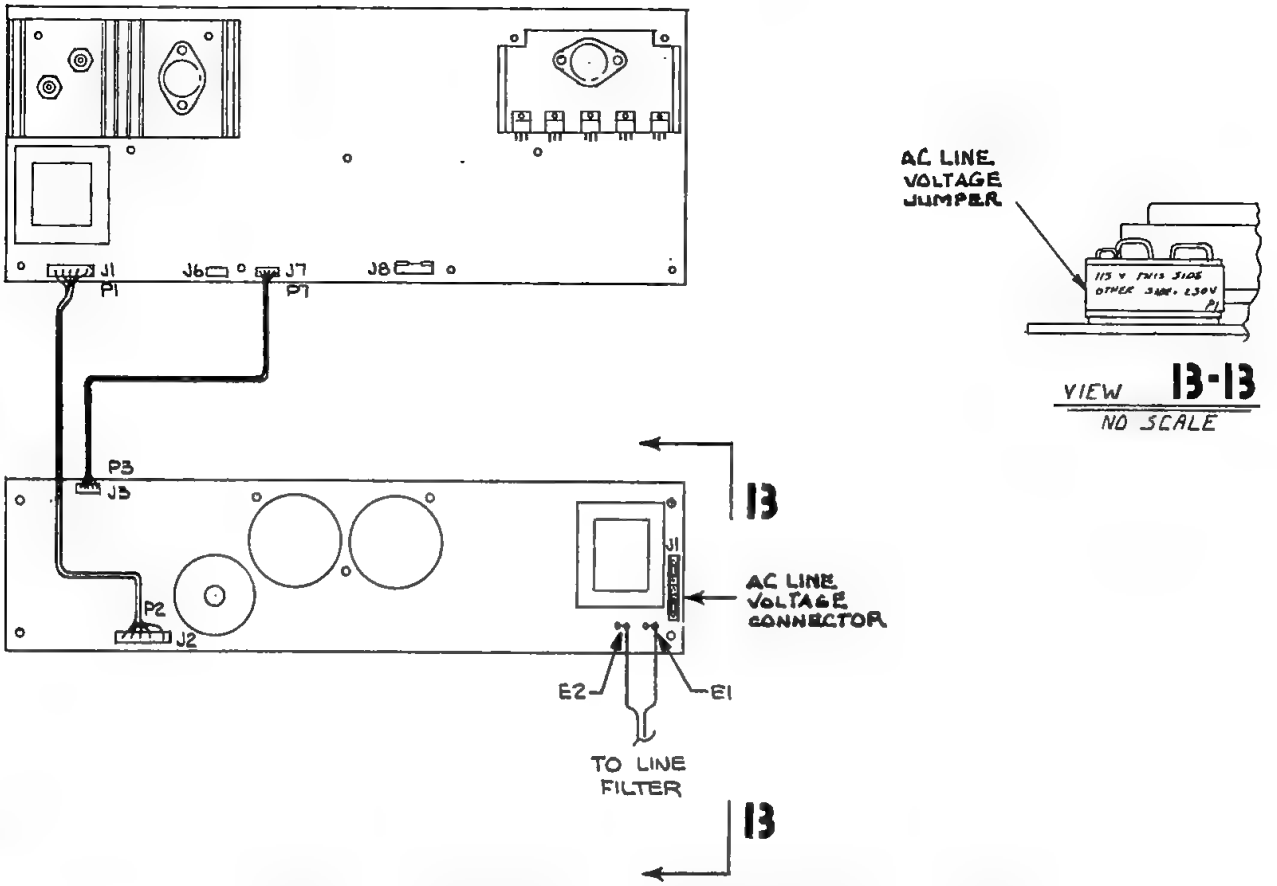


Figure 2-3. Power Supply AC Line Voltage Jumper Diagram

2-6. COOLING REQUIREMENTS

Chassis cooling is provided by fans mounted in the power supply enclosure. The chassis cooling system is designed to draw room air in through openings in the grill on the bottom of the front panel. The air passes by the installed peripheral devices and is drawn through holes in the top of the power supply. Fans force the air down through the power supply and out the grill in the back of the chassis. These fans operate whenever AC power is switched on. A temperature detector will shut down DC power when the internal temperature within the power supply exceeds 70°C.

When using a winchester type disk drive in one of the peripheral locations, the remaining location must be loaded with either another disk drive or an air baffle to ensure at least 130lfm air flow over the device installed.

Ambient air intake temperature range for the chassis power supply should be between 10°C and 40°C. Operating temperature range specifications as measured within the enclosure are dependent on user supplied equipment. The maximum temperature change should not exceed 11°C per hour.

All chassis panels must be in place for optimum air circulation. To insure proper cooling of the unit, the holes in the back of the chassis should not be obstructed. A space of at least three inches should be maintained between the back of the chassis and any wall or other obstruction.

2-7. PHYSICAL DIMENSIONS

The physical dimensions of the iSBC 680/681 Multistore Chassis are listed in Table 1-1.

2.8. RACK MOUNTING

The hardware required to install the iSBC 681 Multistore Chassis into a standard RETMA 19-inch wide rack is supplied with the unit when shipped from the factory. The chassis is supplied with one set of support brackets which are designed to be used on the slides which are attached to the chassis. See Figures 2-4 and 2-5.

Use the following procedure to install the chassis into a rack enclosure:

NOTE

This procedure requires two people.

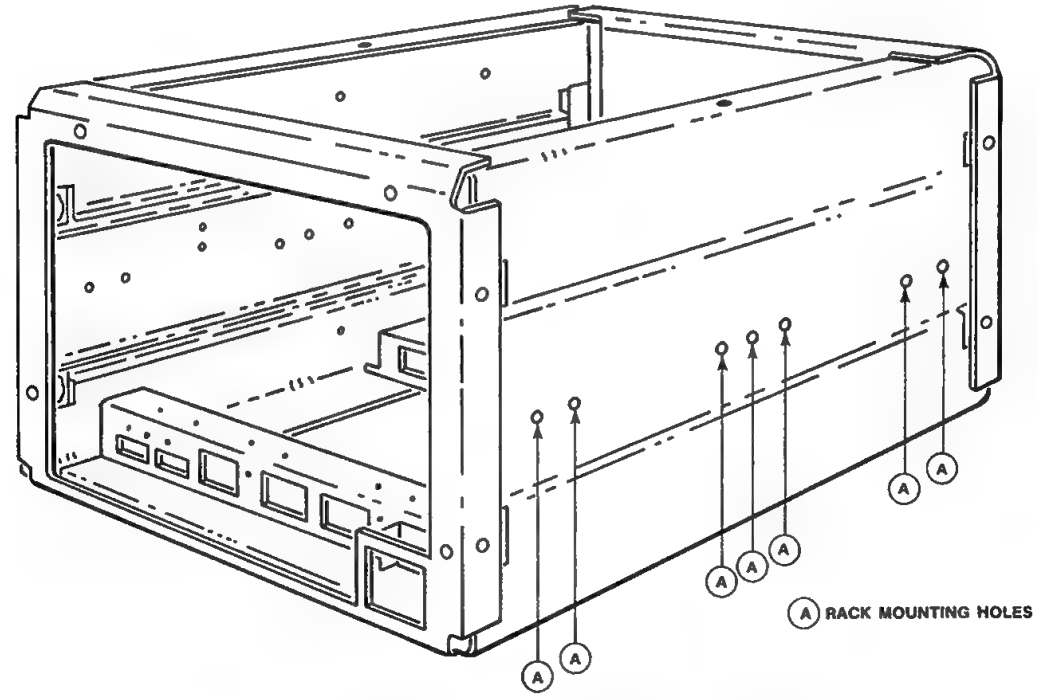


Figure 2-4. Chassis Side View, Rack Mount Positions

a. Remove front bezel on chassis, if installed.

b. Install two slides on each side of the chassis as shown in Figure 2-4. Then install the slide mount brackets on the slides with 8-32″ by 3/8″ pan-head screws as shown in Figure 2-5.

c. Using two people, lift the chassis into the rack enclosure and position at the desired height. Attach the sliding mount into the RETMA rack, by securing the slide mount bracket to the rack.

d. Install front bezel.

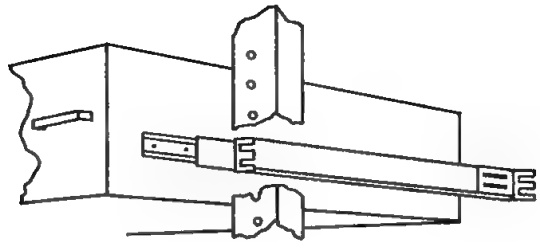
2-9. PRIORITY RESOLUTION

The iSBC 680/681 chassis is designed to accept all Intel iSBC boards. Modules that use the Multibus system bus have a master/slave relationship. A master board can drive the command and address lines, i.e. it can control the bus. A Single Board Computer is an example of a bus master. A bus slave cannot control the bus. Memory and I/O expansion boards are examples of bus slaves. For more information on this relationship see Intel Multibus Interfacing Application Note AP-28A.

The Multibus system can accommodate several bus masters on the same system, each one taking control of the bus as needed to effect data transfers. In cases where the operator uses two or more master boards, it will be necessary to place the highest priority master in slot J6 unless the system priority resolution scheme is changed. The system is configured by the factory with slot J6 as the right most slot as one faces the system enclosure. The remaining five slots can be used for any expansion board, or lower priority master boards.

Parallel priority resolution, described in Paragraph 2-10 is the only priority method available.

Another consideration in setting up a multimaster system is the Multibus clock signal source. Ensure only one of the master boards is supplying the BCLK and CCLK signals to the Multibus lines. All master boards have provisions for disabling the output of these two signals (i.e., preventing the signals from going off-board). Refer to the hardware reference manual and schematic diagrams for the particular master boards being used.



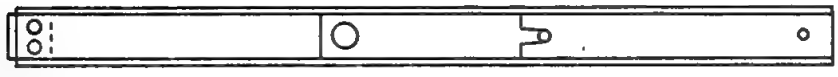


Figure 2-5. Rack Mount Attachment Diagram

2-10. PARALLEL PRIORITY RESOLUTION

The parallel priority resolution scheme allows up to six bus masters in a single system to acquire and control the Multibus lines. In the parallel priority technique, priority is resolved in a priority resolution circuit in which the highest priority BREQ/ input is encoded with a priority encoder chip (74148). The value is then decoded with a priority decoder chip (74S138) to activate the appropriate BPRN/ line. The BPRO/ lines are not used in the parallel priority scheme and thus are not connected on the backplane. Figure 2-6 illustrates a typical method for resolving bus contention in a system. Figure 2-7 illustrates the wiring diagram for the bus priority resolution scheme used on the iSBC 680/681. The BPRN/, BREQ/ and INT/ jumpers are shown in Figure 2-8.

The iSBC 680/681 Chassis is configured by Intel with input 1 (J6) having the highest priority and input 6 (J1) having the lowest priority. To change the priority encoding/decoding scheme it is necessary to change the BREQ/ (Bus Request Signal) and the BPRN/ (Bus Priority In Signal) jumpers on the cardcage assembly.

For instance, to change the highest priority input from input 1 (J6) to input 5 (J2), use the following procedure:

a. Turn the AC power switch OFF.

b. Remove the top cover which is secured by quarter-turn screws, if attached.

c. Remove the jumpers on locations 1 and 5 of both the BREQ/ and BPRN/ jumpers, see Figure 2-8.

d. Install a wire-wrap jumper from the input of location 1 to the output of location 5 on both the BREQ/ and BPRN/ jumpers, see Figures 2-7 and 2-8.

e. Install a wire-wrap jumper from the input of location 1 to the output of location 5 on both the BREQ/ and BPRN/ jumpers, see Figures 2-7 and 2-8.

NOTE

The input of each location is on the right side of the jumper and the output is on the left side of the jumper, as the operator faces the unit (see figure 2-8).

f. Replace the top cover.

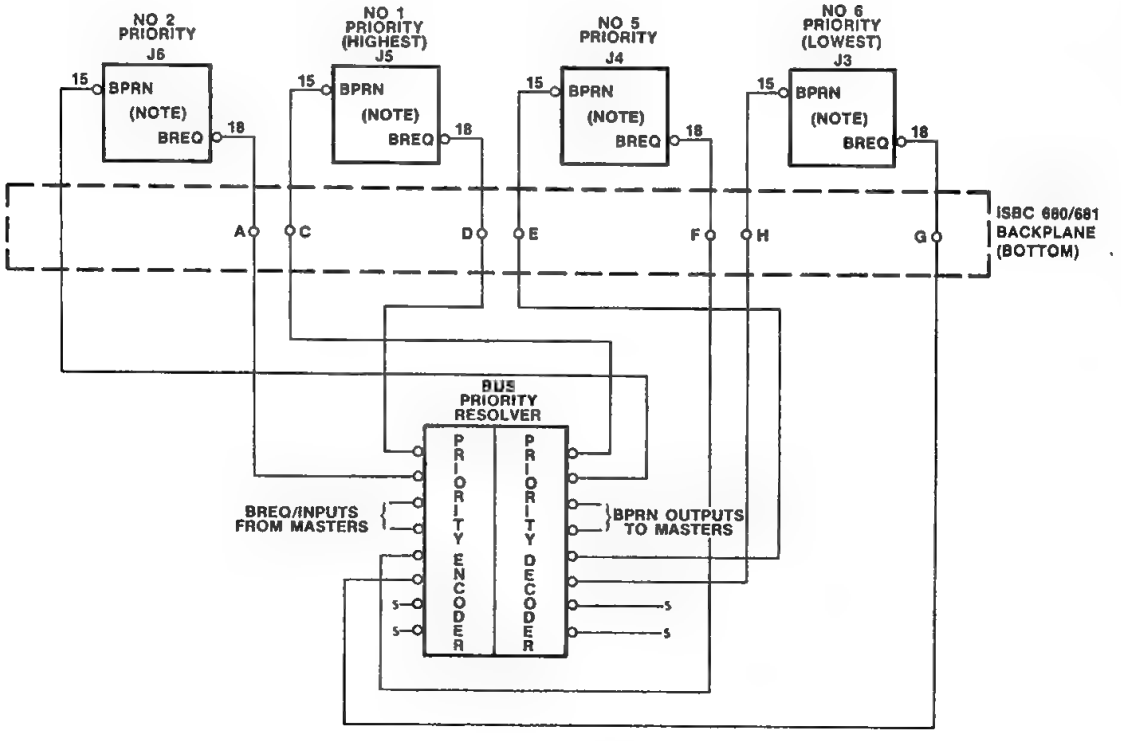


Figure 2-6. Parallel Priority Resolution Technique

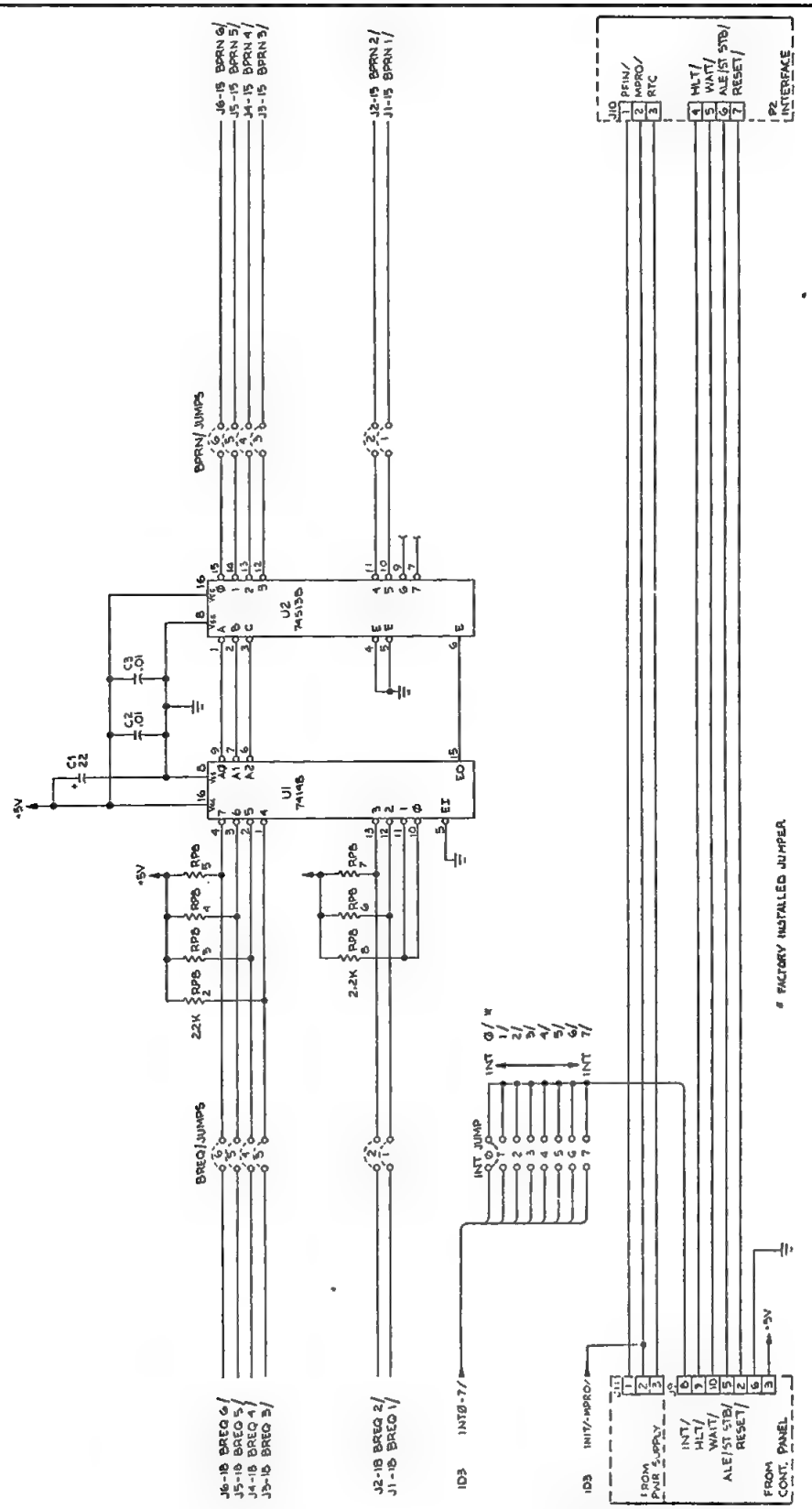


Figure 2-7. Bus Priority and Interrupt Wiring Schematic

CAUTION: These schematic diagrams may have been revised.

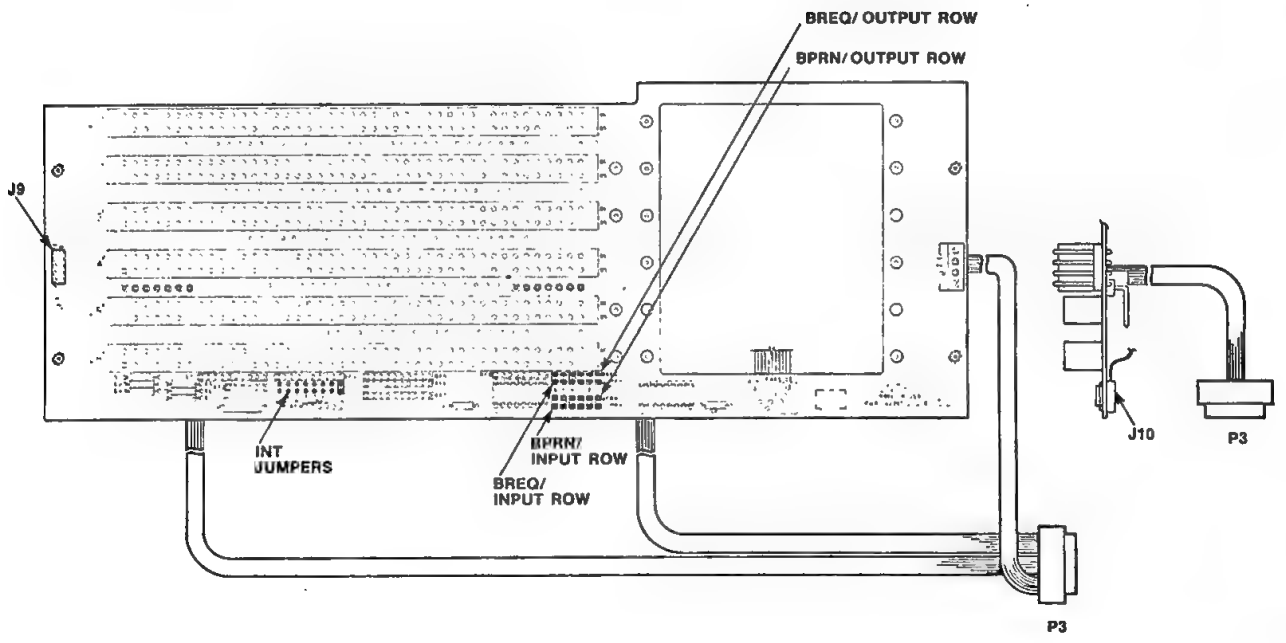


Figure 2-8. Backplane Jumper Location Diagram

2-11. INTERRUPT LEVEL MODIFICATION

The Interrupt Pushbutton switch is wired to interrupt level 0 (Multibus P1-41) by the factory. To change the interrupt level it is necessary to change the INT/ (Interrupt Request Line) jumper on the cardcage assembly. The interrupt jumper is changed by removing the current INT/ jumper and replacing it in another INT/ jumper location. The numbers on the cardcage INT/ jumper locations correspond directly to the Multibus P1 Interrupt pins 35 to 42, see Figures 2-7 and 2-8.

2-12. MULTIBUS BOARD INSTALLATION

CAUTION

Always turn the AC power switch OFF before installing or removing a board.

User supplied Multibus boards can be installed in the chassis cardcage using the following procedure:

a. Turn the AC power switch OFF, if ON.

b. Remove the top cover, which is attached by quarter turn fasteners, if attached.

c. Remove the center top brace by removing the screws that secure the brace to the chassis and any peripheral devices installed, see Figure 2-9.

d. Insert each board with the component side facing right as one faces the front of the chassis. Note that an iSBC host board with iSBX Multimodule boards installed should be inserted into slot J6 to avoid using two chassis board slots.

NOTE

Never use excessive force when installing a board. An abnormal amount of restriction during installation may indicate improper board alignment or possible connector failure.

e. Install all I/O connectors and check to make sure the interrupt jumper and priority resolution jumpers are properly installed (refer to Paragraphs 2-9 and 2-10 for more information).

f. Re-install the center top brace by securing the brace to the chassis and any peripheral devices installed.

g. Re-install the top cover.

NOTE

All covers must be installed to ensure proper air circulation within the chassis.

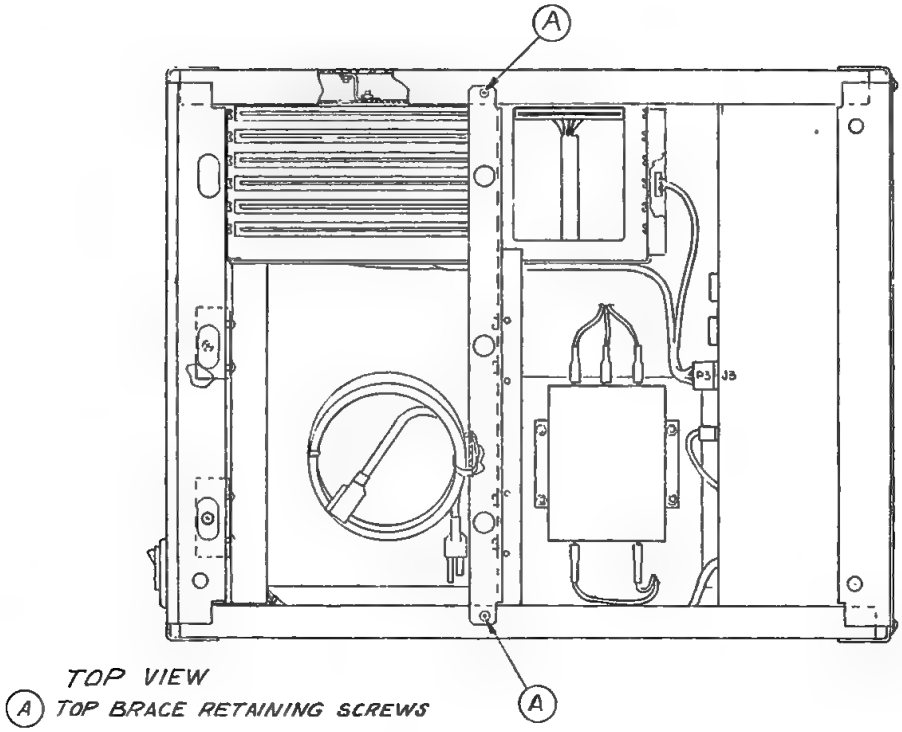


Figure 2-9. Chassis Top View

2-13. USER SUPPLIED PERIPHERAL INSTALLATION

User supplied peripheral devices can be installed in the chassis using the following procedure:

a. Turn the AC power switch OFF, if ON.

WARNING

Hazardous voltages are present within the iSBC 680/681 whenever the power cord is connected. Disconnect the AC power cord from the chassis before attempting to service the power supply.

b. Disconnect the AC power cord from the back of the chassis, if AC power is used by the peripheral being installed.

c. Remove the top cover, which is attached by quarter turn fasteners.

d. Remove the front bezel, which is attached via pop plugs and can be pulled off.

e. Remove the front filler panel covering the opening to be used for the installation of the peripheral. Each panel is attached with two screws, one at the bottom and one at the top of the panel, see Figure 2-10.

f. Install the drive mount base on the peripheral to be installed. The drive mount base should first be centered on the base of the peripheral, then attached with 8-32 x 1/4" screws, see Figure 2-11.

g. Slide the peripheral through the opening in the front of the chassis. Make sure the base slides easily in the slot provided in the chassis.

h. Install the power and I/O connectors when the peripheral is halfway into the unit. See Paragraph 2-14 for instructions on installing user supplied connectors.

i. Once all connectors are installed, slide the peripheral fully into the chassis and secure the drive mount slide to the chassis. Install a single 8-32 x 1/4" screw in the slot provided on the front tab of the drive mount slide.

j. Re-install the front filler panel (if appropriate), the top cover and the front bezel.

k. Re-connect the AC power cord, if disconnected.

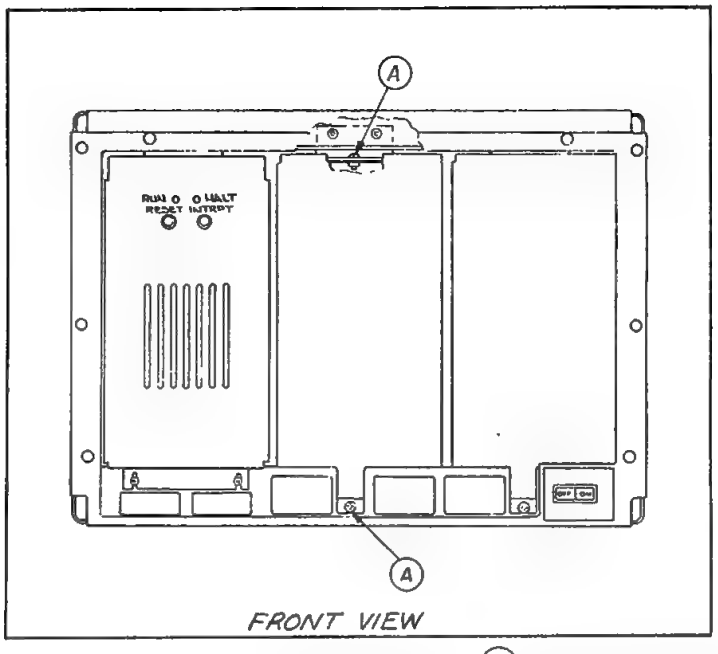


Figure 2-10. Front Filler Panel Installation

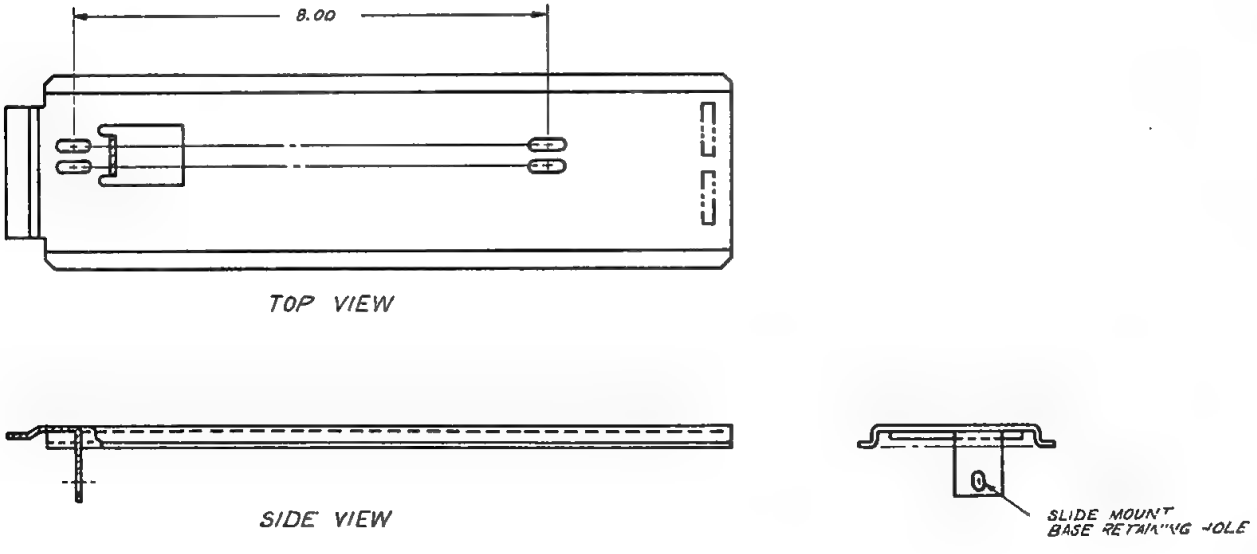


Figure 2-11. Peripheral Slide Mount Base

2-14. USER SUPPLIED CONNECTOR INSTALLATION

The following three sections (2-15, 2-16 and 2-17) describe the installation of user supplied connectors, the AC power, DC power and backpanel.

2-15. AC POWER CONNECTOR INSTALLATION

AC power for user supplied peripherals can be obtained from the AC terminal strip next to the AC power cord attachement on the rear of the unit. Positions 4 and 5 on the terminal strip are switched and filtered AC power, with position 1 being chassis ground, see Figure 2-12.

User Supplied AC cables can be installed by using the following procedure:

WARNING

The AC power switch does not remove AC power from the chassis. Unplug the AC power cord before attempting any service on the chassis.

a. Turn AC power switch OFF.

b. Disconnect the AC power cord, if installed.

c. Place the chassis on its side with the bottom of the chassis facing the user.

d. Remove the four rubber feet (by turning counter-clockwise) and remove the bottom panel.

e. Remove the cover that protects the AC barrier strip.

f. Attach the necessary wires for AC power and ground using terminal lugs, see Figure 2-12.

g. Upon completion of this procedure make sure that all wires in this area are properly attached, then re-attach the protective cover and the bottom panel. Place the unit upright and check to see that other connections in the chassis have not been disturbed by this operation.

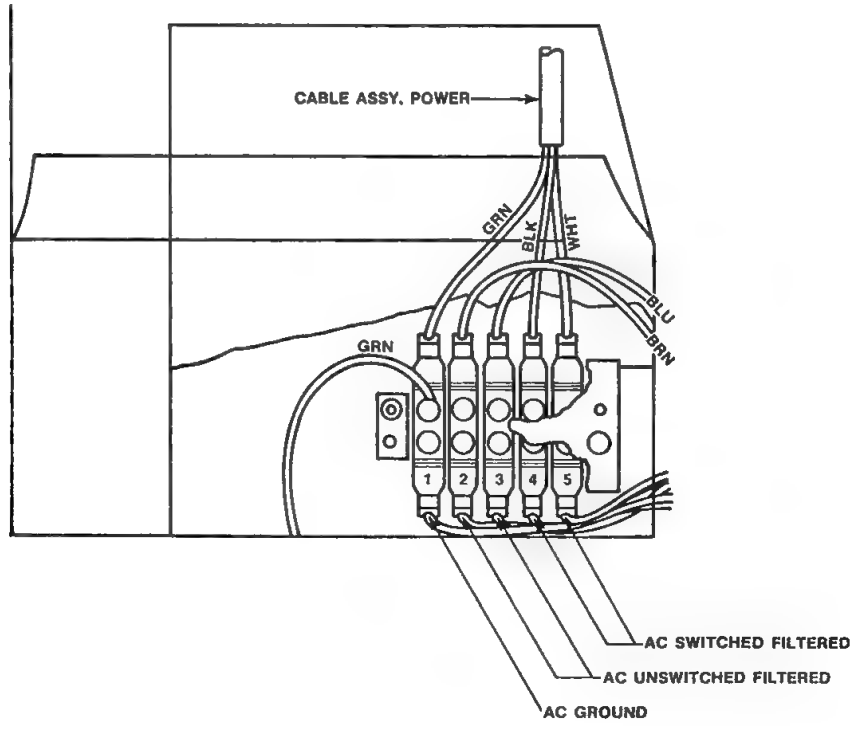


Figure 2-12. AC Terminal Strip Diagram

2-16. DC POWER CONNECTOR INSTALLATION

DC power for user supplied peripherals is obtained from the two 9-pin peripheral connectors on the front of the power supply. Six DC output voltages are available from each of these connectors, see Table 2-1 and Figure 2-1. To install a DC power connector use the following procedure:

a. Turn AC power switch OFF.

b. Remove the top cover, if attached.

c. Install a 9-pin male connector (AMP P/N 1-480706-0) in the connector on the power supply.

2-17. BACKPANEL CONNECTOR INSTALLATION

Six slots are provided on the backpanel of the system chassis for the securing of user supplied external connectors. These six slots are covered when delivered from the factory. Each slot is large enough for one 50-pin delta connector, e.g. AMP 2-552476-1 or T&B Ansley 609-50F. To install a connector in any of these slots, use the following procedure:

a. Turn the AC power switch OFF.

WARNING

Never attempt any service on the underside of the chassis with the AC power cord connected to the chassis. Hazardous voltages are present within the chassis whenever the power cord is connected.

b. Disconnect the AC power cord.

c. Set the chassis on its left or right side with the bottom of the chassis facing the operator.

d. Remove the four rubber feet and the bottom panel.

e. Remove the cover from the slot to be used.

f. Install the connector in the slot securing it with 4-40 x 3/8" screws.

g. Re-install the bottom panel and four rubber feet ensuring the cable from the connector is accessible through the top of the chassis.

2-18. SHUGART DATA SEPARATOR BOARD INSTALLATION

A Shugart Associates SA1200 Data Separator Board may be installed inside the chassis on the left side next to the cardcage. To install this board use the following procedure:

a. Turn the AC power switch OFF.

WARNING

The AC power switch does not remove AC power from the chassis. Unplug the AC power cord before attempting any service on the chassis.

b. Disconnect the AC power cord, if installed.

c. Remove the top cover, which is attached by quarter turn fasteners.

d. Remove the left side-panel which is attached by ball-stud fasteners (the side panel next to the cardcage).

e. Place the chassis on its right side, with the bottom of the chassis facing the user and the side with the cardcage facing up. Remove the four rubber feet (by turning counterclockwise) and remove the bottom panel.

f. Install the board inside the chassis with the connectors facing the bottom of the unit and the component side of the separator board facing the cardcage, see Figure 2-13. The two top screws are 6-32 by 3/4" flat-head screws. 7/16" spacers are installed between the board and the chassis. The two bottom screws are 4-40 by 1/2" pan-head screws, with 1/4" spacers installed between the board and the chassis.

g. Reaching through the opening in the bottom of the chassis, attach the cables on the separator board.

h. After completion of this procedure, ensure that all cables are properly attached, then install the bottom panel. Place the unit in the upright position and check that none of the other connections within the chassis were affected by this operation.

i. Install all removed covers.

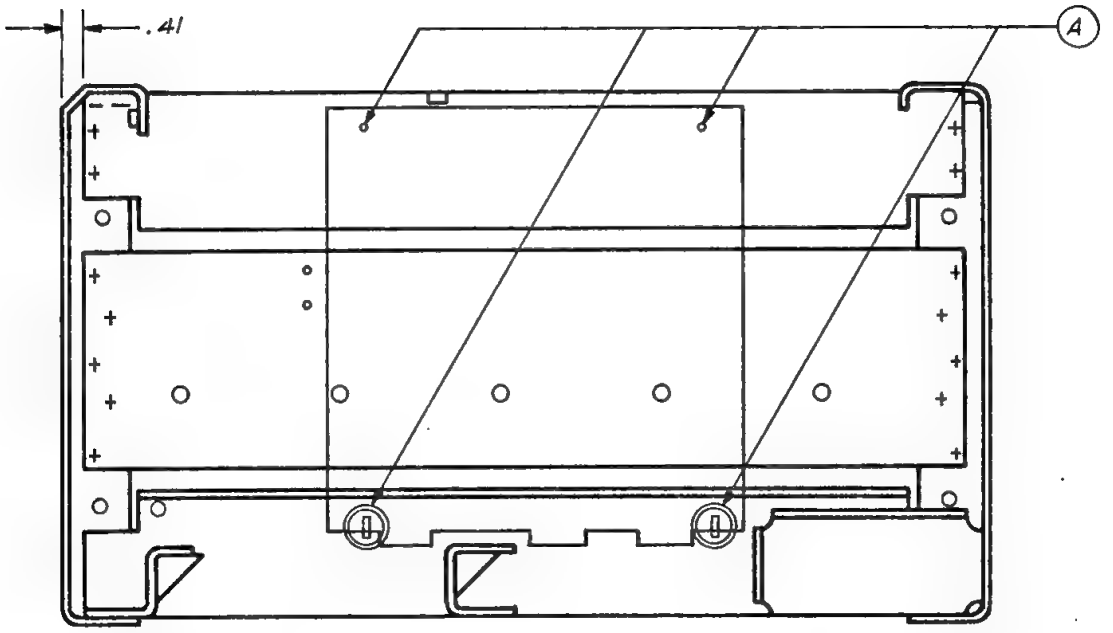


Figure 2-13. Shugart Data Separator Board Installation Diagram

CHAPTER 3
PRINCIPLES OF OPERATION

3-1. INTRODUCTION

This chapter provides basic operating instructions for the iSBC 680/681 Multistore Chassis. Chassis operation consists primarily of switch and indicator use.

3-2. FUNCTIONAL DESCRIPTION, iSBC 680 CHASSIS

The iSBC 680/681 Multistore Chassis is a stand-alone peripheral enclosure designed to house up to two standard 8-inch peripherals and six Multibus compatible circuit boards. The system is supported on a bench or table by four rubber feet.

All controls and indicators are located on the front of the chassis. The power switch is an illuminated rocker switch with built-in power breaker.

3-3. FUNCTIONAL DESCRIPTION, iSBC 681 CHASSIS

The iSBC 681 chassis is identical in operation and layout to the iSBC 680 chassis, except the front bezel on the iSBC 681 is large enough to cover a rack-mount slot. Rack mount support brackets are provided with the iSBC 681 when shipped from the factory.

3-4. FUNCTIONAL DESCRIPTION, CHASSIS POWER SUPPLY

The iSBC 680/681 uses a high-efficiency, six output, 300 watt switching power supply designed for use in single board computer applications. Power supply features include overvoltage, overcurrent, and overtemperature protection circuitry. All output voltages are regulated to ± 2% of the specified voltage. The specification for each of the six output voltages is provided in Table 2-1. The AC/DC power distribution schematic is provided in Figure 3-1.

AC power required by the power supply is provided by a three lead cable going from the AC terminal strip through the opening in the bottom of the chassis to the connectors within the power supply. Switched and unswitched AC power is available on the terminal strip as shown in Figure 3-2. The terminal strip is located under the power cord connector in the back of the chassis. To install and remove AC cables refer to the connector installation instructions in Chapter 2.

DC power required by the Multibus backplane assembly is provided via the 12-pin AMP connector mounted on the right side of the front panel of the power supply. The power cable from the power supply to the backplane assembly is factory installed. The two 9-pin AMP connectors on the power supply are provided for DC power connection to peripheral devices.

Automatic restart after power-on, power-fail interrupt, and real-time clock output are routed from the power supply to the backplane assembly, providing a time base reference and means for recovery after a power loss.

The cooling fans are located in the power supply enclosure and are user accessible.

3-5. AC POWER ON/OFF SWITCH

The AC power ON/OFF switch is a rocker type utility switch which applies line power to the chassis power supply. When +5 VDC power is supplied to the chassis the AC ON front panel indicator lamp will light. The AC power switch contains a built-in on/off power breaker.

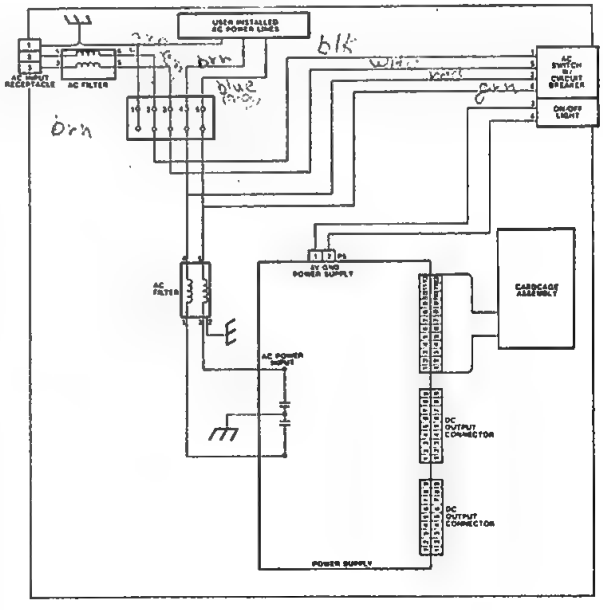


Figure 3-1. AC/DC Power Distribution Diagram

When the AC power switch is put in the ON position, power is supplied to the power supply which initiates a power-up sequence. The power switch receives filtered AC current, Figure 3-1.

A 10 amp 115/220VAC, 50-60Hz line filter is used between the backpanel and the AC power switch, to filter AC current delivered to the AC terminal strip, and subsequently to the power supply or any user peripherals requiring AC power. See Chapter 2 for information on connecting AC power to peripheral devices. The power breaker is a rated 10-amp motor-start type breaker with manual reset.

WARNING

Hazardous voltages are present within the chassis whenever the AC power cord is attached. Unplug the power cord from the AC source before attempting any service.

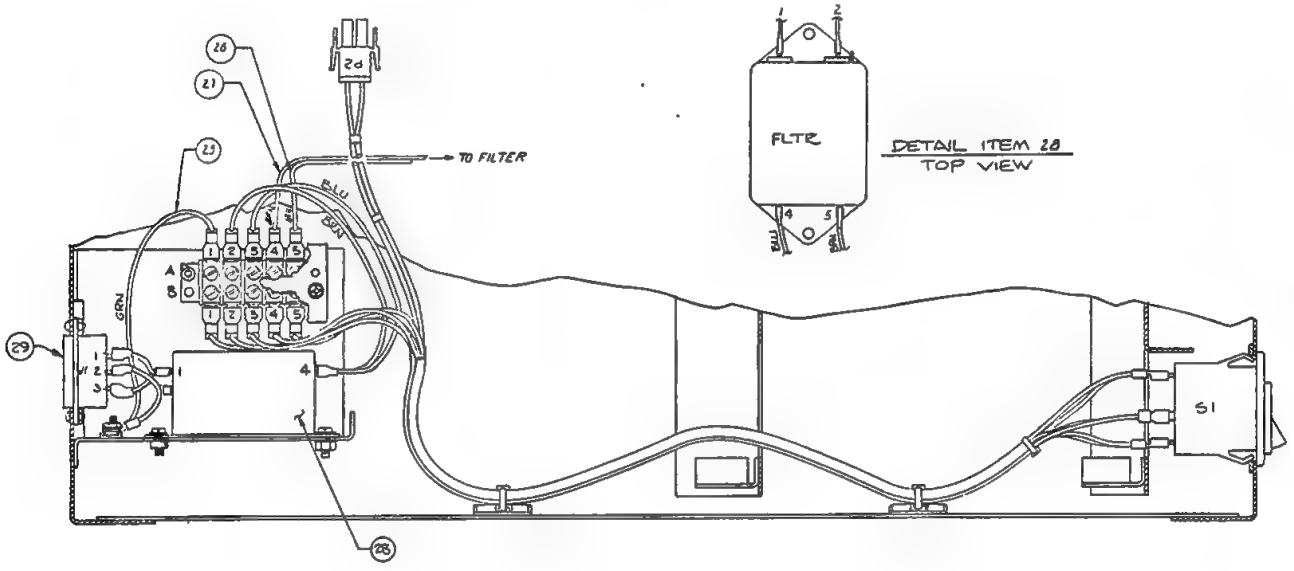


Figure 3-2. AC Wiring Diagram

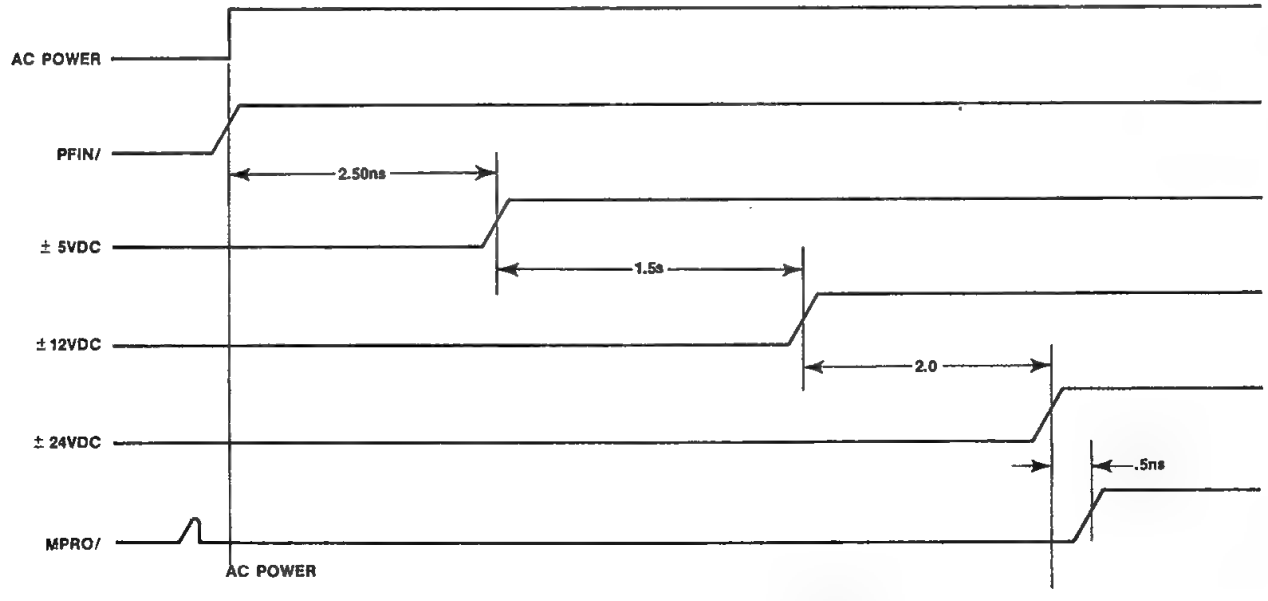


Figure 3-3. Power-On Sequence Diagram

3-6. POWER-ON SEQUENCE DESCRIPTION

DC power is provided from the power supply on initial power-up in the following sequence: (1) ± 5 V comes up to specification, (2) within 2 seconds ± 12 V comes up to specification and (3) within five seconds ± 24 V comes up to specification.

3-7. FRONT PANEL SWITCHES

The following paragraphs describe the iSBC 680/681 front panel switches, Figure 3-4.

a. INTERRUPT pushbutton switch: is used to force the master CPU board to execute an interrupt service routine. Typically, this switch is wired to interrupt level 0 (INT0/) on the CPU board (Multibus pin P1-41). This may be altered by a chassis jumper modification refer to chapter 2 for instructions on this alteration.

b. RESET pushbutton switch: is used to force the master CPU board to execute the reset (initialize) routine. This switch is wired to pin P2-38 (AUX/RST) on the P2 connector (J10).

3-8. FRONT PANEL INDICATORS

The following paragraphs describe the indicator lamps on the front panel of each chassis.

a. AC ON: System AC power status indicator. The light in the rocker arm comes on when +5 VDC is valid. This happens shortly after the AC ON/OFF switch is placed in the ON position.

b. RUN: CPU board status indicator. Lights when the master CPU is executing any instruction, including WAIT status. It extinguishes after a HALT instruction is executed, or during the power-on routine. The P2 connector (pins 30 and 32) routes the system's status from connector (P10) through connector (J10) to the front panel printed wiring assembly.

c. HALT: CPU board status indicator. Lights after a HALT instruction is executed by the master CPU board, or during the power-on routine. The P2 connector (J10) (pin 28) routes the system's status from connector (P10) through connector (J10) to the front panel printed wiring assembly.

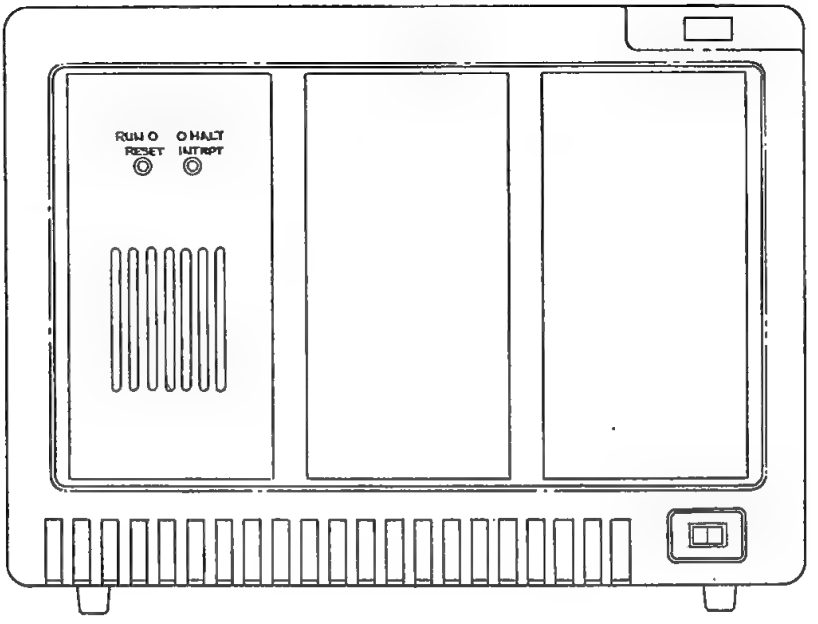


Figure 3-4. iSBC 680 Front Panel Illustration

3-9. MULTIBUS DESCRIPTION

The iSBC 680/681 Multistore Chassis provides power and flexibility from the use of the Intel Multibus system bus. The bus structure provides a common element for communication between a wide variety of system modules which include: Single Board Computers, memory, digital and analog I/O boards, and peripheral controllers. The iSBC 680/681 was designed to enhance the operation of a user developed system by providing an easy way to interface a variety of elements which depend on the Multibus interface for their linkage.

This manual assumes the user is familiar with the INTEL MULTIBUS Specification, Order No. 980683 and INTEL MULTIBUS Interfacing Application Note AP-28A. For information on the capabilities and specifications of the INTEL Multibus, please consult these documents and Figure 3-5.

The iSBC 680/681 is shipped from the factory with a standard Multibus backplane which has the P2 connector (J10) aligned in slot J1 of the cardcage. The chassis backplane is configured with slot J6 having the highest priority. To change the priority scheme refer to Paragraph 2-10. The user can also modify the front-panel interrupt level, refer to Paragraph 2-11.

3-10. AC POWER-FAIL CONDITION

An AC power-fail condition exists when the AC input power drops below the preset failure level for 8 milliseconds, Table 1-1. This condition causes the power supply shut down DC outputs in the sequence shown in Figure 3-6.

The iSBC 680 provides a PFIN/ (Power Fail Interrupt) signal and MPRO/ (Memory Protect) signal. Typically, these control signals are used by a system developer's software or firmware to interrupt the CPU and halt memory operations until power is restored. When power is restored by reaching the preset recovery level, a specific restart sequence is executed by the power supply to bring up output voltages in an orderly fashion allowing the system to resume processing.

Assuming the power supply is operating and AC power is interrupted, the following events occur:

a. When the line voltage drops below the preset level and remains below that level for 8 milliseconds, power-fail commences. If the line voltage returns to the specified limits before the 8 millisecond period expires, the power supply outputs remain uninterrupted.

b. After power is lost for the 8 millisecond period, ±24, VDC outputs decrease per the sequence shown in Figure 3-6.

c. 16 milliseconds after AC power lost, ±12 VDC outputs decrease to zero.

d. Sixty-five nanoseconds after the ±12 VDC outputs are shut off. ±5 Volts DC outputs go off and all voltages are lost.

3-11. OVERVOLTAGE AND OVER-CURRENT CONDITION

Power supply circuitry includes overvoltage and overcurrent protection. These limits are specified in Table 1-1.

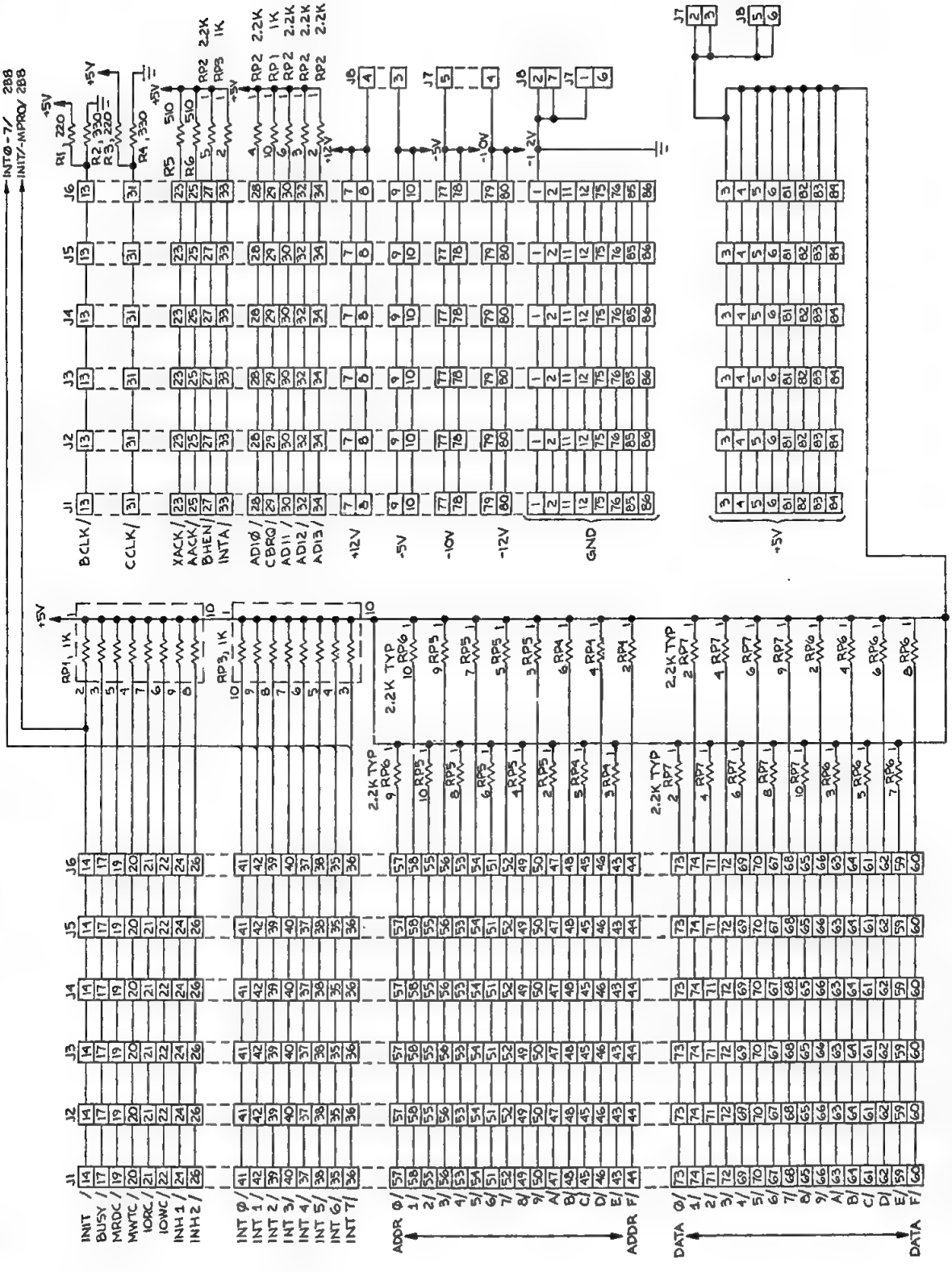
The AC ON/OFF switch uses a manual power breaker. To reset the power supply you must turn the AC power ON/OFF switch OFF, and then back ON. The power supply will not begin power up if an overvoltage or overcurrent condition exists.

NOTE

There are no user serviceable fuses on the power supply and all power supply problems should be referred to the INTEL Corp. service center (See Section 4-2).

3-12. POWER FAIL AND REAL TIME CLOCK

The iSBC 680/681 has three TTL signals, RTC/, (Real Time Clock), PFIN/, (Power Fail Interrupter) and MPRO/ (Memory Protect). Each of these signals is routed on the DC power cable from the power supply to connector J11 on the cardcage assembly. These signals are in turn routed to the connecter J10 on the Multibus backplane and connector P10 which is attached to connector P2 on some Intel single board computers. Paragraphs 3-13, 3-14, and 3-15 describe each signals.



CAUTION: These schematic diagrams may have been revised.

Figure 3-5. Chassis Backplane Schematic

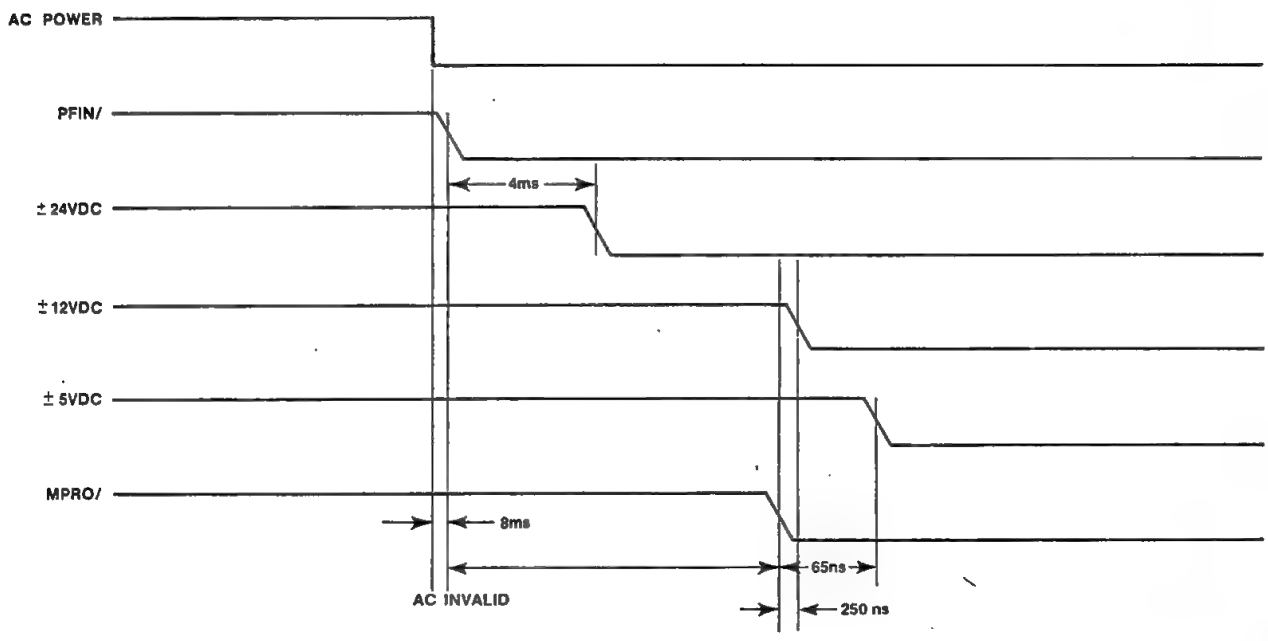


Figure 3-6. Power-Fail Timing Diagram

3-13. REAL-TIME CLOCK SIGNAL DESCRIPTION

The real-time clock is a free running multivibrator that is synchronized to the AC power line, Figure 3-7. The RTC signal frequency will be twice the AC line frequency. Real-time clock circuitry within the power supply generates a control signal (RTC) which may be used in a variety of ways. Typically, this signal would be used to implement a time-of-day clock on a single board computer. The signal is routed on the cardcage DC cable assembly to the backplane assembly, Figures 2-7, 3-1, 3-7. The RTC/ signal is routed from connector P3-4 to the P2 connector (J10-27).

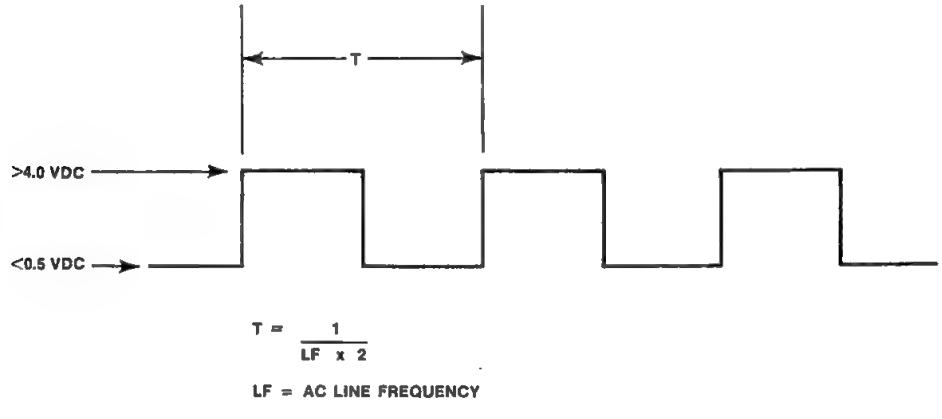


Figure 3-7. Real-Time Clock Timing Diagram

3-14. POWER-FAIL INTERRUPT SIGNAL DESCRIPTION

Power-fail detection circuitry on the iSBC 682 option generates two control signals (PFIN/ and MPRO/). These signals are routed on the cardcage DC cable assembly to connector J10 on the cardcage assembly, see Figures 2-7, 2-8, 3-1 and 3-8.

Typically, these signals are used to activate a specific power-fail routine in a Single Board Computer, and to provide signals for resuming operation when AC power is restored, see Figures 3-3 and 3-6. In instances where the user would like to provide battery backup after power-fail, the user needs to supply a Multibus module or board which provides that capability.

Assuming the power supply is operating normally when AC power is interrupted the following events occur:

a. When the line voltage drops below the present level and remains below that level for 8 milliseconds, power-fail commences, see Figure 3-6.

b. Within 4 milliseconds after PFIN goes low, ±24 are essentially lost.

c. PFIN/ remains true (low) during the 8 milliseconds when ±24 VDC are off.

d. At the end of this 8 millisecond period the signal MPRO/ (Memory Protect) goes low (true) and ±12VDC are lost. MPRO/ is typically used to halt all memory operations on the single board computer.

e. Within 65 nanoseconds after MPRO/ goes low (true), ±5VDC go out of specification and are essentially off.

3-15. AUTOMATIC RESTART SIGNAL DESCRIPTION

The PFIN/ and MPRO signals may be used to initiate user written software routines. These signals for instance could be used as notification to the master CPU board to initiate a disk based booting system.

a. When the preset AC level is reached, the power supply begins its power-up sequence, see Figure 3-3.

b. First PFIN/ goes false (high).

c. Within 250 milliseconds of PFIN/ going high, +5VDC come up to specification. MPRO/ remains true until all voltages come up to specification.

d. Within 2.0 seconds after PFIN/ goes false, ±12VDC come up to specification.

e. Within 4.0 seconds of power-on, ±24VDC come up to specification and MPRO/ goes high (false).

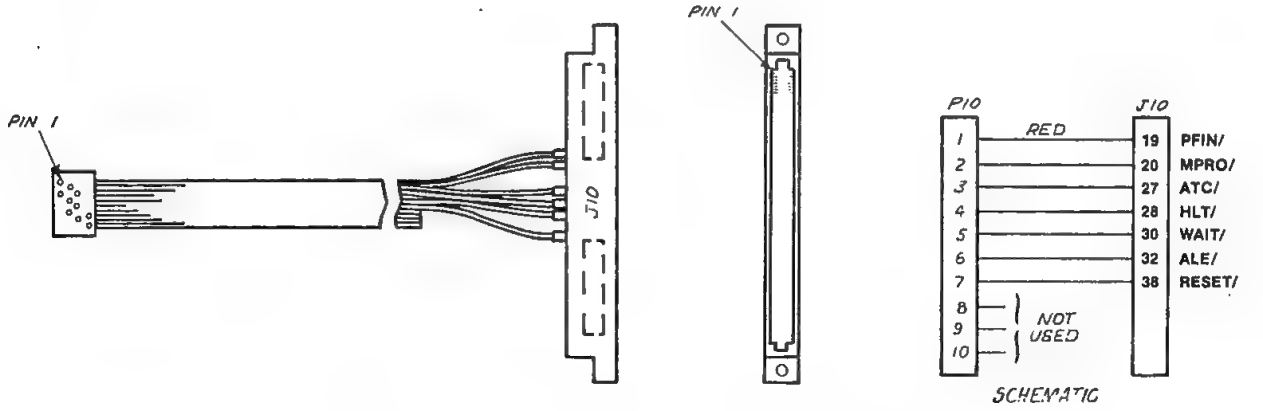


Figure 3-8. P2 Connector (J10/P10) Diagram

CHAPTER 4
SERVICE INFORMATION

4-1. INTRODUCTION

This chapter provides service and repair assistance information, and a replacement parts list. For personnel safety and chassis protection, refer all servicing to qualified personnel only.

4-2. SERVICE AND REPAIR ASSISTANCE

United States customers can obtain service and repair assistance by contacting the Intel Repair Center via the Product Service Hotline. Customers outside the United States should contact their sales source (Intel Sales Office or Authorized Distributor) for service information and repair assistance.

Before calling the Product Service Hotline, you should have the following information available:

a. Date you received the product.

b. Complete part number of the product (including dash number). On boards, this number is usually silk-screened onto the board. On other Intel products it is usually stamped on a label.

c. Serial number of product. On boards, this number is usually stamped on the board. On other Intel products the serial number is usually stamped on a label.

d. Shipping and billing addresses.

e. If your Intel product warranty has expired, you must provide a purchase order number for billing purposes.

f. If you have an extended warranty agreement, be sure to advise the Hotline personnel of this agreement.

Use the following numbers for contacting the Intel Product Service Hotline:

TELEPHONE:

All U.S. locations, except Alaska, Arizona & Hawaii:

(800) 528 - 0595

All other locations:

(602) 869 - 4600

TWX number:

(910) 951 - 1330

Always contact the Product Service Hotline before returning a product to Intel for repair. You will be given a repair authorization number, shipping instructions, and other important information which will help Intel provide you with fast, efficient service. If you are returning the product because of damage sustained during shipment, or if the product is out of warranty, a purchase order is required before Intel can initiate the repair.

In preparing the product for shipment to the Repair Center, use the original factory packing material if possible. If this material is not available, wrap the product in a cushioning material such as Air Cap TH-240, manufactured by the Sealed Air Corporation, Hawthorne, N.J. Then enclose in a heavy duty corrugated shipping carton and label "FRAGILE" to ensure careful handling. Ship only to the address specified by Product Service Hotline personnel.

4-3. POWER SUPPLY FUSES

The iSBC 680/681 Chassis has no user replaceable fuses. A blown fuse indicates that other power supply components have also been damaged. A power supply with a blown fuse should be sent to the Intel Repair Center. Section 4-2 provides instructions for contacting the Intel Repair Center in Phoenix, Arizona.

4-4. COOLING FAN ACCESS AND REPLACEMENT

The iSBC 680/681 Multistore Chassis is provided with three cooling fans located within the power supply enclosure. The fans are driven by the +12 VDC from the power supply.

The fans do not require periodic maintenance, but should they require replacement use the following procedure.

Fan removal and replacement procedure.

a. Turn AC power switch OFF.

WARNING

Do not attempt servicing with AC power applied to the back of the chassis. Unplug the power cord from the AC source before attempting any service.

b. Remove power cord, if installed.

c. Remove power supply from the iSBC 680/681 Chassis using the following steps:

1. Detach all cables on front panel of power supply, see Figure 2-1.

2. Remove the six retaining screws on the back of the iSBC 680/681 chassis, see Figure 2-2.

3. Slide power supply out the back of the chassis. As soon as the supply is out of the chassis, lay the power supply on its back with the AC cable opening in the bottom of the power supply facing the chassis.

d. Remove the fan housing from the power supply module by removing the 4-40 screws on the power supply fan restraint, see Figure 4-1 and then slide the fan housing out of the power supply module. Set the fan housing next to the power supply, ensuring that the DC power cable running from the power supply to the fan module is not damaged.

e. Remove and replace fan (see Figure 4-2).

1. Detach the two terminal lugs for the fan from the terminal strip.

2. Unscrew the four retaining screws on the fan.

3. Remove fan from unit.

4. Install new fan.

f. Insure that all other connections in this area have not been disturbed during the installation.

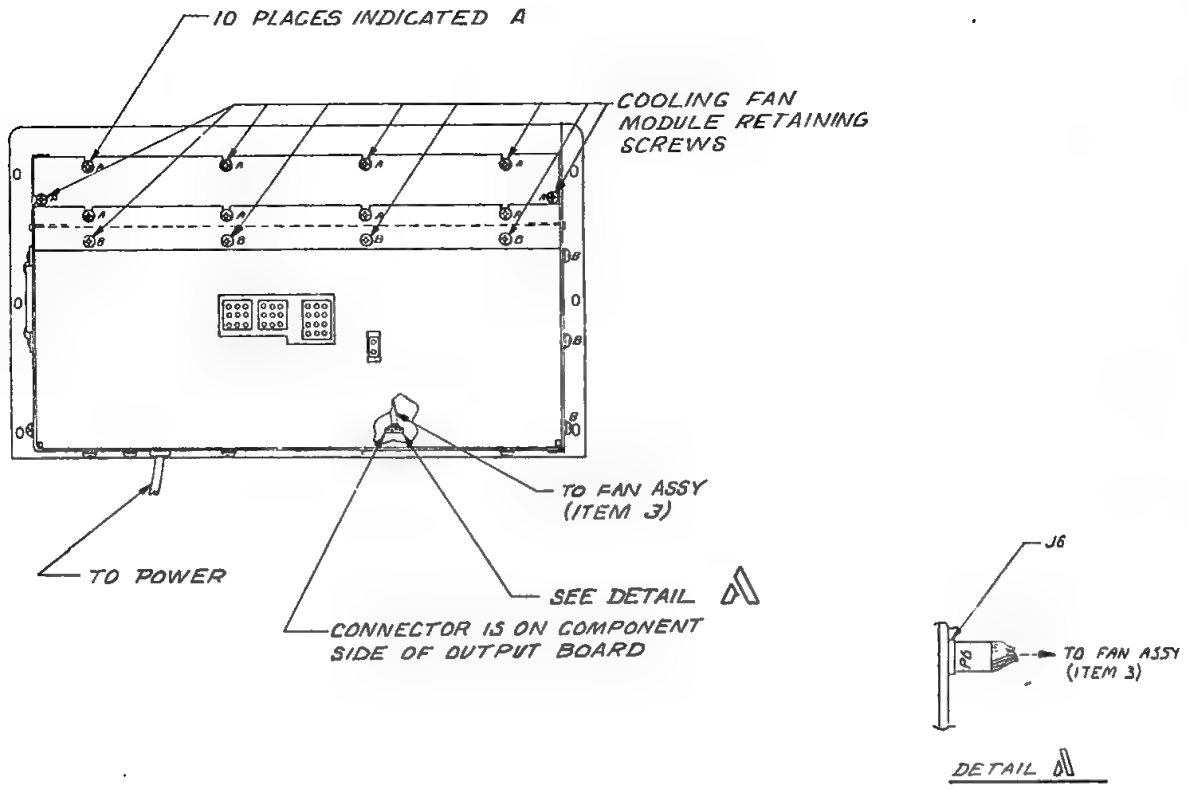


Figure 4-1. Cooling Fan Module Diagram

g. Re-install the fan housing module in the power supply enclosure.

h. Re-install power supply in chassis using the following steps:
   1. Slide power supply into back of chassis.
   2. Attach by inserting the six retaining screws.
   3. Attach all cables to front of power supply.

i. Re-install any connectors removed from the front of the power supply.

4-5 CARDCAGE ACCESS AND REMOVAL

The easiest way to access the cardcage is to reach in from the top. Since the blackplane is closer to the front of the chassis, it cannot be accessed from the back of the enclosure. The schematic for servicing the backplane is provided in Appendix B.

To remove the cardcage, use the following procedure.

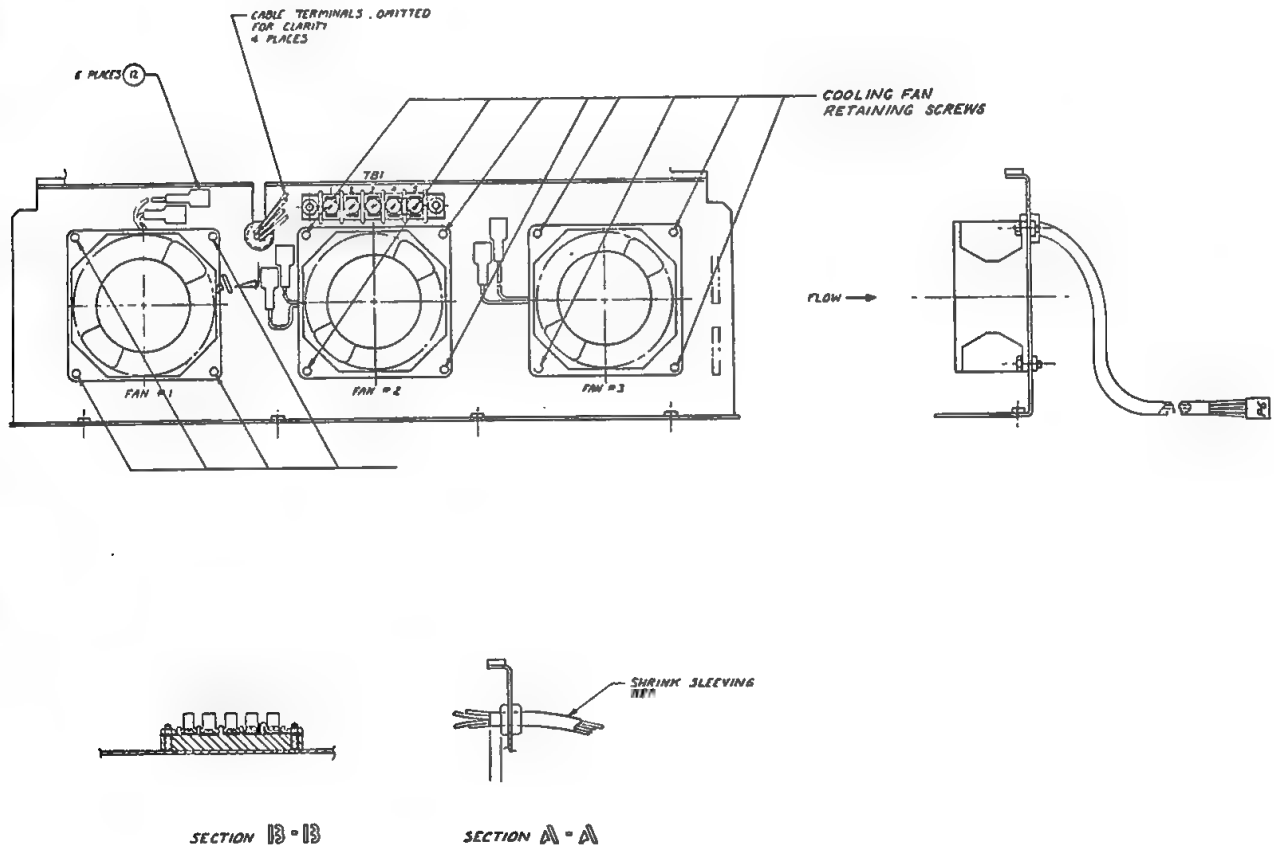


Figure 4-2. Cooling Fan Installation Diagram

WARNING

Never service the iSBC 680/681 with AC power on, or with the AC power cord plugged in. Hazardous voltages are present with the iSBC 680/681 whenever the AC power cord is plugged in to a power source.

a. Turn the AC power switch OFF.

b. Unplug the AC power cord from the chassis.

c. Remove the top panel, if attached.

d. Unplug the DC power connector from the power supply.

e. Remove all SBC boards from the cardcage. When the top-center brace of the chassis is in place, it is necessary to remove it to enable board removal.

f. Using a long screwdriver, remove the five cardcage retaining screws, see Figures 4-3, 4-4, and 4-5.

g. Lift the cardcage and front panel out through the top of the chassis.

h. To replace the cardcage, perform this procedure in reverse order.

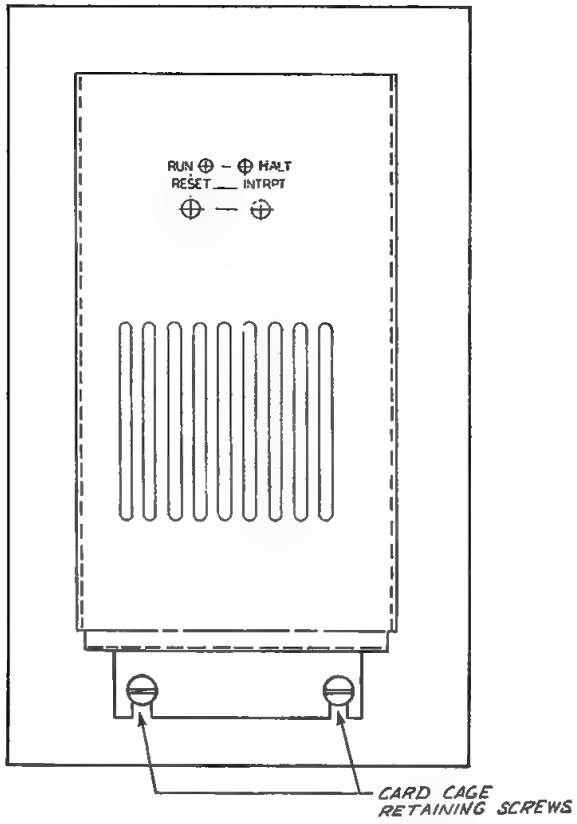


Figure 4-3. Cardcage Front View

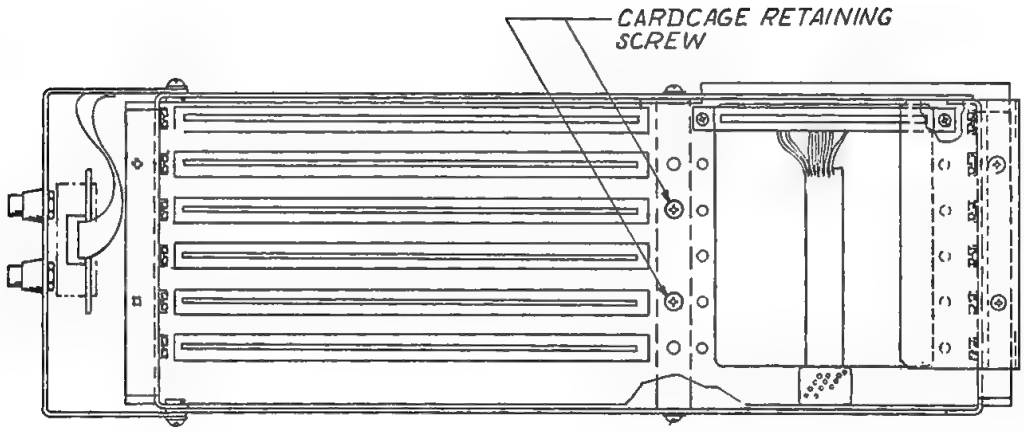


Figure 4-4. Cardcage Top View

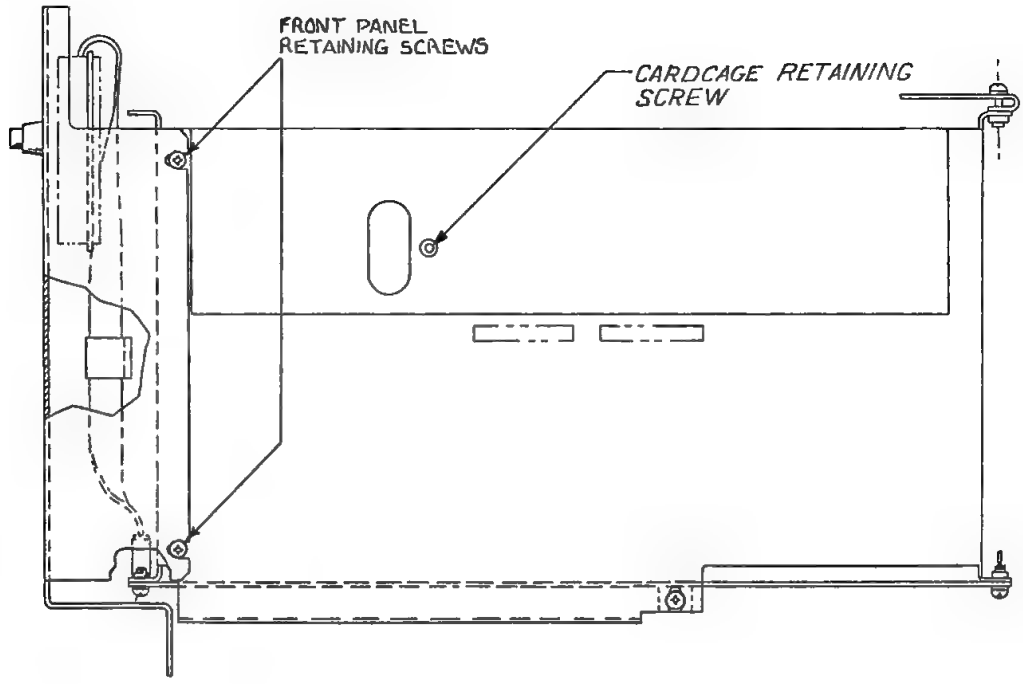


Figure 4-5. Cardcage Side View

4-6. FRONT PANEL MAINTENANCE

Front panel switches and lights are easily accessible when the cardcage is removed from the chassis. Maintenance of the front panel circuit board should be referred to Intel. Paragraph 4-2 provides instructions for contacting the Intel Repair Center.

To remove the front panel, use the following procedure:

WARNING

Never service the iSBC 680/681 with AC power on, or with the AC power cord plugged in. Hazardous voltages are present with the iSBC 680/681 whenever the AC power cord is plugged in to a power source.

a. Remove the cardcage from the iSBC 680/681 chassis, refer to Paragraph 4-5.

b. Remove the four retaining screws holding the front panel on the cardcage, see Figure 4-5.

c. Unplug the cable from the front panel to the cardcage.

d. Reverse this procedure to re-install the front panel.

To remove the front panel circuit board from the front panel, use the following procedure:

a. Remove the front panel from the cardcage as described in the previous steps.

b. Remove the two retaining switch collars holding the circuit board to the front panel by unscrewing the switch collars.

c. Refer servicing of the circuit board to the INTEL repair center, see Paragraph 4-2.

4-7. AC SWITCH ACCESS AND REPLACEMENT

The easiest way to access the AC switch is to reach in from the top. The switch is held in place in the lower right hand corner of the chassis by four spring clips, and can be easily removed by pushing the switch from the rear.

To remove and replace the AC switch, use the following procedure:

WARNING

Never service the iSBC 680/681 with the AC power cord plugged in. Hazardous voltages are present with the chassis whenever the AC power cord is plugged into a power source.

a. Turn the AC power switch OFF.

b. Unplug the AC power cord from the chassis.

c. If installed, remove the peripheral device from the right most slot in the chassis.

d. Unplug the connector wires on the back of the switch, see Figure 4-6.

e. Push the switch from the back, out through the front opening.

f. Reverse this procedure to re-install the switch.

4-8. CABLE ACCESS AND REPLACEMENT

All cables on the iSBC 680/681 chassis are easily accessible and changeable. The previous sections of this manual describe their access, removal, and replacement.

a. AC wiring harness, refer to Figures 3-1 and 3-2.

b. AC terminal strip wiring, refer to Paragraph 2-15 and Figure 2-12.

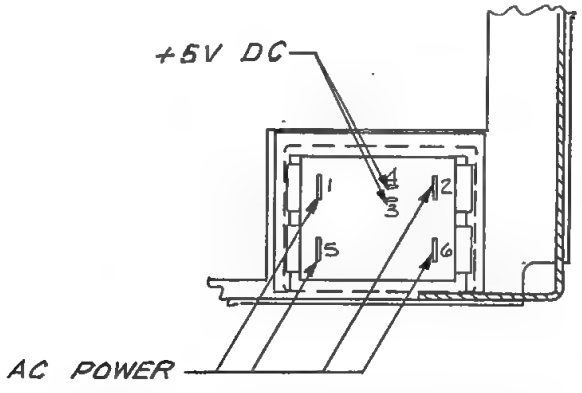


Figure 4-6. AC Switch Rear View

c. DC peripheral cable wiring, refer to Paragraph 2-16 and Table 2-1.

d. P2 connector on the backplane, refer to Figure 3-9.

4-9. REPLACEMENT PARTS

A complete list of replacement parts for the iSBC 680/681 Multistore™ Chassis is provided in Table 4-1. This list provides the part number, manufacturer, description, and quantity of each item. Notice that each item is referenced in a parts location diagram. Table 4-2 provides the full name of the manufacturer which is abbreviated in Table 4-1. Some of the more common parts are available from any commercial source and should be ordered by description only. These parts are called out as CMI in the table, rather than listing a specific part number.

Table 4-1. Replacement Parts List

Description	Part Number*	Manufacturer	Qty**
Chassis, Weldment	162112-001	Intel	
Power Supply Assembly	162491-001	Intel	
Power Supply Assembly	162491-002	Intel	
Power Supply Module	162505-001	Intel	
Fan Tray Assembly	162544-001	Intel	
Power Supply Plate	162496-001	Intel	
Cover, Jumper Access	162502-001	Intel	
Screw, Phillips Pan Head, 6/32 x .32		COML	(28)
Washer, SpLk, #6		COML	(10)
Washer, Flat, #6		COML	(28)
Connector Covers, Chassis Rear	162282-001	Intel	(6)
Screw, Phillips Pan Head, 8/32 x .50		COML	(6)
Caution Label	142682-001	Intel	
Serial Number Label	340272-001	Intel	
IC 74148		COML	
IC 74S138		COML	
Card Cage Assembly	162401-001	Intel	
Card Cage Bracket	162423-001	Intel	
Support Bracket, Top	162268-001	Intel	(2)
Cover Assembly, Bottom	162131-001	Intel	
Cover Assembly, Top	162128-001	Intel	
Cover Assembly, Side	162132-002	Intel	(2)
Top Angle Support	162266-001	Intel	
Screw, Phillips Pan Head, 6/32 x .50		COML	(4)
Screw, Phillips Pan Head, 8/32 x .50		COML	(6)
Screw, Phillips Pan Head, 6/32 x .75		COML	(2)
Screw, Phillips Pan Head, 6/32 x .50		COML	(5)
Washer, Flat, #6		COML	(9)
Washer, Flat, #8		COML	(6)
Nut, KEPS, 6/32		COML	
Power Cord, 10 amp		COML	
Cable Tie		COML	(2)
Filler Panels, Front	162138-001	Intel	
Cable Assembly, Power Breaker	162114-001	Intel	
Terminal Block Cover	102780-005	Intel	
Screw, Phillips Pan Head, 6/32 x .25		COML	(2)
Terminal Block	162573-001		
Terminal Block Marker	102792-004		
Standoff, rnd, 6/32 x .50		COML	(2)
Washer, split-lk, cps, #6		COML	(4)
Breaker Switch, 10 amp	104257-001		
Screw, Phillips Flat Head, 6/32 x .50		COML	(4)
Screw, Phillips Pan Head, 8/32 x .50		COML	(6)
Screw, Phillips Pan Head, TF, 4/40 x .38		COML	

*Contact Intel Product Service Hotline for current part numbers. See Section 4-2.
**Quantity is one unless otherwise indicated.

Table 4-1. Replacement Parts List (Continued)

Description	Part Number*	Manufacturer	Qty**
Washer, Flat, #8		COML	(6)
Nut, KEPS, 6/32		COML	
Cable Tie		COML	(2)
Tie Mount, Adhesive Back		COML	(2)
Nut, KEPS, 4/40		COML	(2)
Washer, Flat, #6		COML	
Terminal Lug, Female, 16 gauge		COML	(2)
Filter, 10 amp	104406-001	Intel	
AC Receptacle Assembly		COML	
Wire Assembly, 9 inch		COML	
Wire Assembly, 3 inch		COML	
DC Cable Assembly	162258-001	Intel	
Front Panel, Printed Wiring Assembly	1003163	Intel	
Power-Fail/Automatic Restart after Power-On and Real Time Clock Option		Intel	
Shipping Container	162567-001	Intel	
ADDITIONAL PARTS FOR iSBC 680, DESKTOP MODEL			
Accessory Kit	162550-001	Intel	
Literature Kit	162568-001	Intel	
Front Panel Assembly, Desktop	162139-001	Intel	
Feet, Black	103757-003	Intel	(4)
1, RACKMOUNT MODEL			
Accessory Kit including Slides	162555-001	Intel	
Literature Kit	162569-001	Intel	
Front Panel Assembly, Rackmount	162135-001	Intel	

*Contact Intel Product Service Hotline for current part numbers. See Section 4-2.
**Quantity is one unless otherwise indicated.

Table 4-2. Manufacturers Codes

Mfr. Code	Manufacturer	Address
Intel COML	Intel Corporation Any Commercial Source; Order by Description (OBD)	Santa Clara, CA

APPENDIX A
INSTALLATION EXAMPLE

A-1. INTRODUCTION

The following example is used to show a possible installation of the iSBC 680/681 Multistore Chassis in one of its many possible applications. This example can be easily duplicated after a software engineer or technician has acquired the parts listed in Table A-1.

Table A-1. Example Parts List

Item	Manufacturer	Part No.
iSBC 86/12 Single board computer	INTEL	SBC 86/12
SBC 016A, 16K RAM	INTEL	SBC 016A
iSBC 215 Winchester Disk Controller	INTEL	SBC 215A
iSBX 218 Flexible diskette Controller	INTEL	SBC 218
Flexible Diskette Disk Drive	Shugart	SA850-1

This example will show the user how to install the devices mentioned. It is assumed that the user is familar with the manuals on the various devices.

A-2. PROBLEM DEFINITION

Assume for the moment you wish to build a device to operate a Shugart SA850 diskette storage drive using readily available single board products. In this particular instance, the necessary peripheral devices can be purchased from your local Intel distributor, and easily installed in the the iSBC 680 to form the kernel of a fully developed stand-alone system. By adding software, such as the RMX/86 operating system, and a terminal device, the iSBC 680 can become a fully functional development tool.

In this particular example we are going to install a SA850 diskette drive, an iSBC 86/12 CPU, iSBC 215 Winchester disk controller, iSBX 218 diskette controller, and an SBC 016A. Before attempting to install these modules it is suggested that the user read each respective reference manual. It is also important that the user read the chassis manual completely before proceeding to duplicate this sample installation.

A-3. INSTALLATION PROCEDURE

This example will be divided into four modules. Module one will include the installation of the AC connector to the terminal barrier strip and the serial I/O cable for the terminal device. Module two will include the installation of the previously assembled and tested MULTIBUS boards. Module three will include the installation of the floppy disk drive. Module four will cover the installation of the necessary cables and accessories.

A-4. AC CONNECTOR AND SERIAL I/O CABLE INSTALLATION

Install an AC power line to furnish AC power to the SA850 floppy disk drive. The user-constructed AC cable should be a 12-inch 3-wire cable having an AMP Mate-N-Lock connector (AMP P/N 1-480700-0) on one end and three terminal lugs on the other end (see Figure A-1).

CAUTION

Never attempt to service the AC line with AC power applied. Hazardous voltages are present within the chassis whenever the AC power cord is attached.

a. To install the terminal lugs on the AC barrier strip, turn the chassis on its side with the bottom facing the user. Remove the four rubber feet and the bottom panel. The protective cover over the AC barrier strip can then be removed. Connect lugs 1 and 3 of the AC line to positions 4 and 5 on the terminal strip (this is a hot AC line). Connect lug 2 (the green wire) to position 1 on the terminal strip (this is a ground line). See Figure 2-13.

b. Ensure that all wires this area are properly connected. Reattach the protective cover.

Use a 25-inch RS 232C cable to extend the 86/12 CPU serial I/O signals to the back of the chassis. Install a standard DB-25 connector (TRW cinch P/N 230-25-11-112) on one end of the cable and a 25-pin cardedge connector (TRW cinch P/N 251-25-90-160) on the other end.

To install the DB-25 connector on the back of the chassis use the following procedure:

1. Cut a piece of sheet metal in the dimensions 3/4" by 1-1/2" that can be used as brace with holes on each end of the brace.
2. Attach one end of the brace to the RS232 connector.

3. Install the RS232 connector with brace in a slot on the back of the chassis using 4-40 by 1/4" screws.
4. Run the cable from the back of the chassis to the cardcage.
5. Reattach the bottom panel making sure the other end of the AC cable and serial I/O cable are accessible through the top of the chassis.
6. Place the chassis upright on its feet.

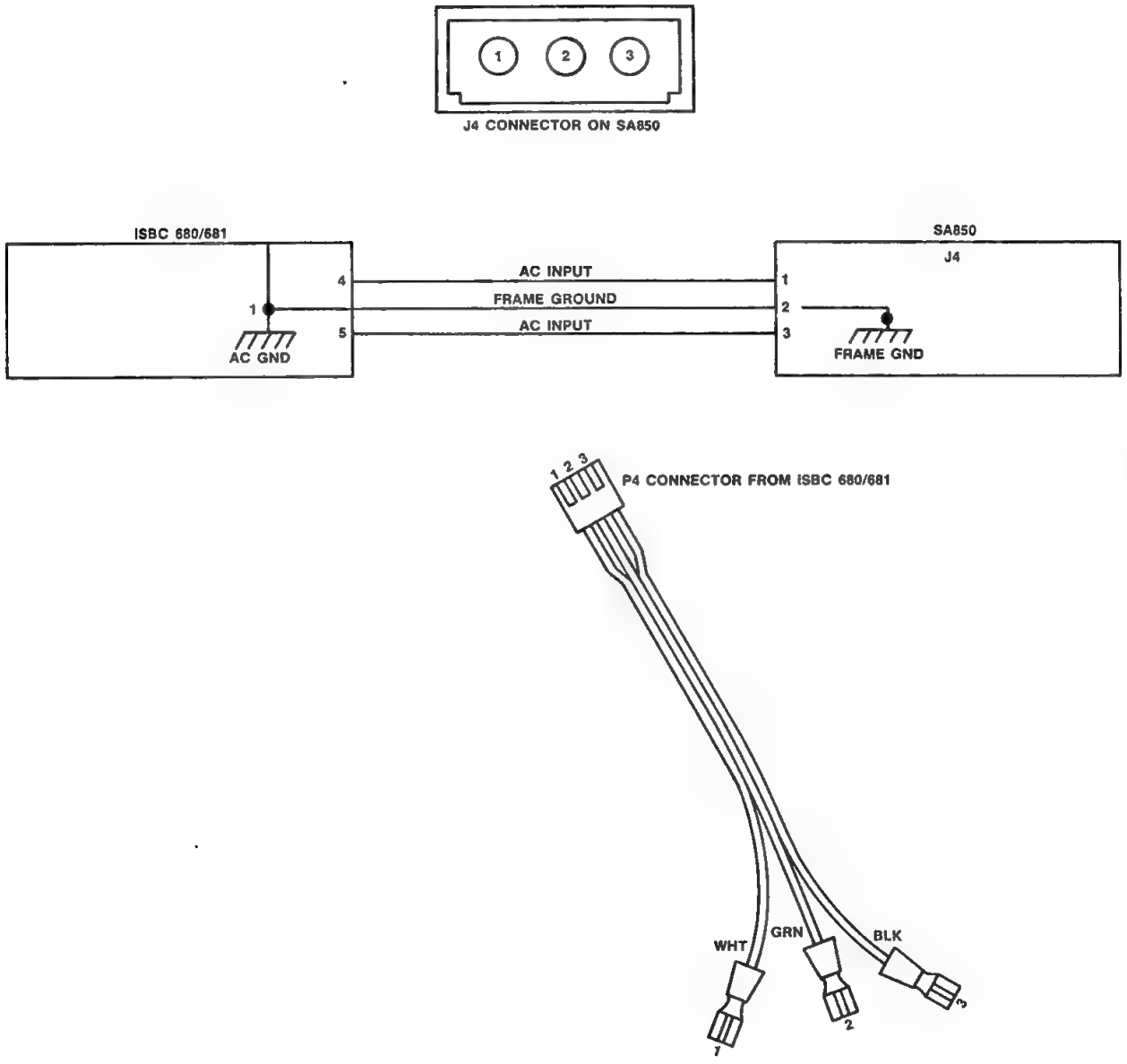


Figure A-1. AC Wiring for Shugart SA850 Diskette Drive Interface

A-5. MULTIBUS BOARD INSTALLATION

Each of the MULTIBUS boards mentioned above may be easily inserted into the iSBC 680 cardcage once the top panel and the center brace on the chassis are removed (if attached). Always note that abnormal restriction on the installation of a board may indicate an improper alignment, and never use excess force when installing a single board product in the cardcage. For more information on the installation of MULTIBUS modules see Section 2-10.

a. Install the iSBX 218 module on the iSBC 215 board as per instructions in the iSBX 218 Flexible Disk Controller Hardware Reference Manual.

b. Install the iSBC 215 disk controller in slot J6 of the cardcage. The component side of the board should face right as the user faces the front of the chassis.

c. Install the iSBC 86/12 CPU board in slot J1.

d. Install the SBC 016A board in any remaining slot.

A-6. SHUGART SA850 DISK DRIVE INSTALLATION

Install the floppy and Winchester disk drives in the chassis using one of the peripheral installation slide mounts provided. For more information on this procedure see Paragraph 2-13.

a. Place the disk drive on its top so that the base slide mount can be attached to the base of the disk drive.

b. Center the drive mount base provided on the base of the disk and attach with 2 each 8-32 x 1/4" panhead screws (see Figure A-2).

c. Pull the front bezel off the chassis and remove the front filler panel covering one of the openings for the peripheral devices (See Figure 2-10).

d. Slide the drive half-way into the chassis through the front opening.

A = SA850 BASE MOUNTING HOLES

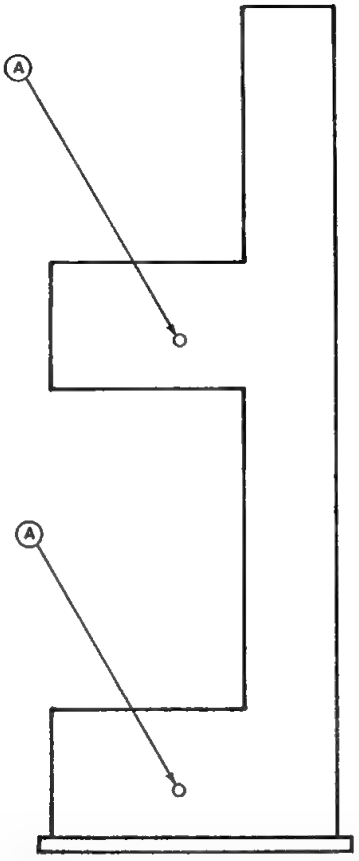


Figure A-2. Shugart SA850 Diskette Drive Mounting Diagram

A-7. CONNECTOR INSTALLATION (3)

Each of the necessary cables can be installed using the following procedure. Always disconnect AC power cord from the chassis before attempting to service AC power on the unit.

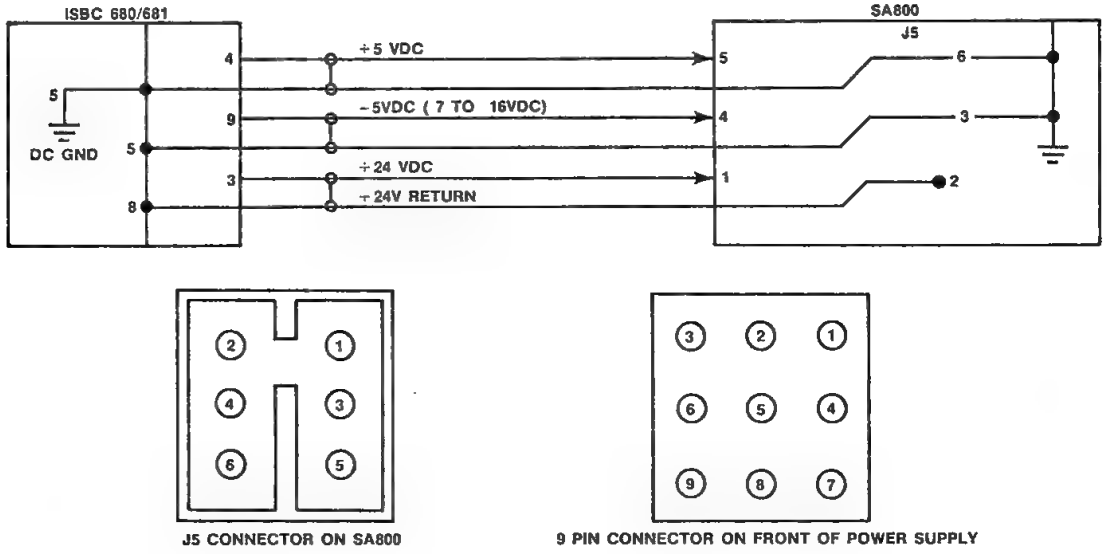
a. Slide the disk drive about half-way out the front of the chassis so that all connectors on the drive are easily accessible through the top of the chassis.

b. Install AC power connector P4 in slot J4 on the disk drive.

c. Install the DC power connector.

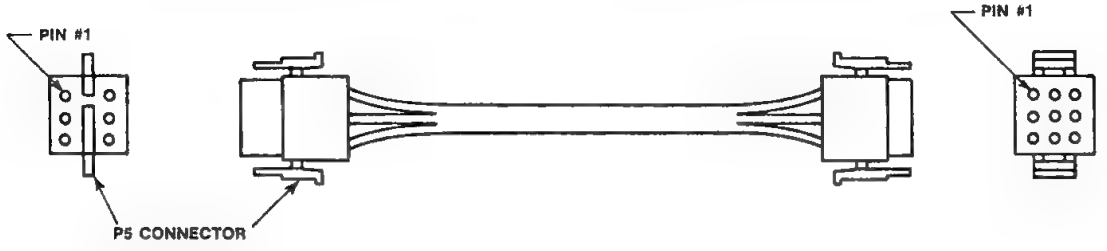
1. Using a 6-inch, 6-wire #26 DC power cable with a 6-pin AMP Mate-N-Lock connector (AMP P/N 1-480270-0) on one end and a 9-pin connector (AMP P/N 1-480706-0) on the other end (see Figure A-3), install the 6-pin connector (P5) in slot J5 on the disk drive.

2. Install the 9-pin connector in the 9-pin receptacle on the front of the power supply, ensuring that pin one on the connector is in the upper left hand corner of the receptacle.



J5 CONNECTOR ON SA800

9 PIN CONNECTOR ON FRONT OF POWER SUPPLY



POWER SUPPLY CONNECTOR	VOLTAGE	SA800 J5 CONNECTOR
1	NC	
2	NC	
3	+24	1
4	+5	5
5	GND	6+3
6	NC	
7	NC	
8	GND	2
9	-5	4
N/C = NOT USED		

Figure A-3. DC Wiring for Shugart SA800 Diskette Drive Interface

d. Install the interface connector.

1. Using an 18-inch, 50-conductor (28AWG stranded) flat cable (3M "Scothflex" P/N 3365/50), with an interface mating connector (3M P/N 3425-0000) on one end and a drive mating connector (P1) on the other end (see iSBX 218 Hardware Reference Manual, Figures A-4 and A-5), install the drive mating connector P1 on the floppy disk drive.

2. Slide the disk drive back into the chassis, ensuring that no cables have been adversely crimped and that all cables are easily accessed through the top of the chassis. Secure the peripheral slide mount to the chassis by installing a 4-40 screw in the opening in the front tab of the peripheral slide mount.

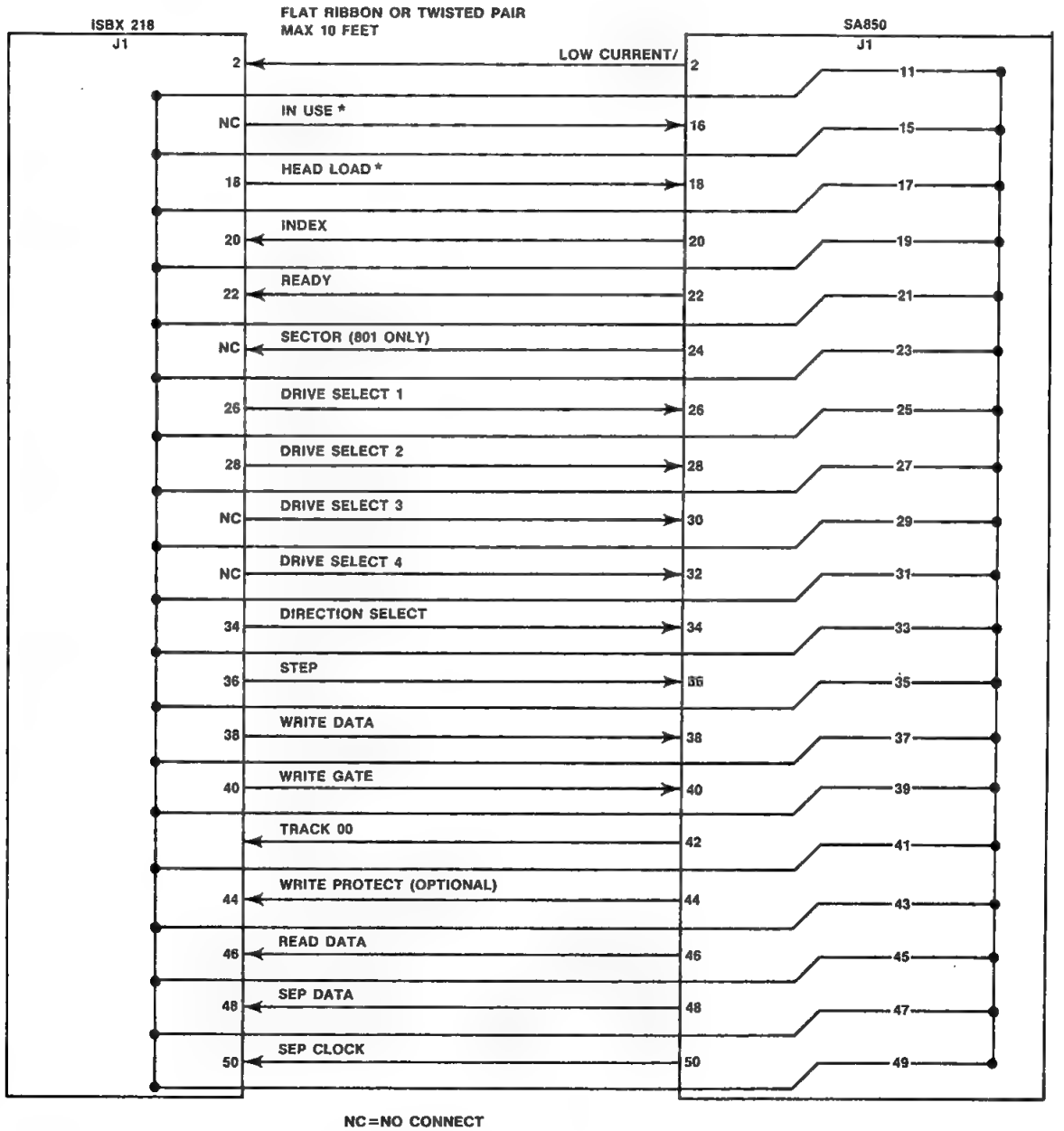


Figure A-4. Diskette Drive Interface Connector Schematic

3. Install the interface mating connector on the iSBX 218 controller, ensuring that the interface connector wire 1 corresponds to the mating connector wire 1 (see Figure A-5).

Complete the installation by attaching the 25-pin cardedge connector to the serial I/O port on the iSBC 86/12 board. Then, secure the top center brace to the chassis and the disk drive with 8-32 x 1/2" screws. Ensure that all connectors are properly installed, and re-install all panels when ready to operate the chassis.

The chassis can be connected to a terminal device, such as a SOROC IQ-120, via the DB-25 connector on the back of the chassis. Utilizing the RMX-86 system software allows the system to be used in a variety of development projects or other computer applications.

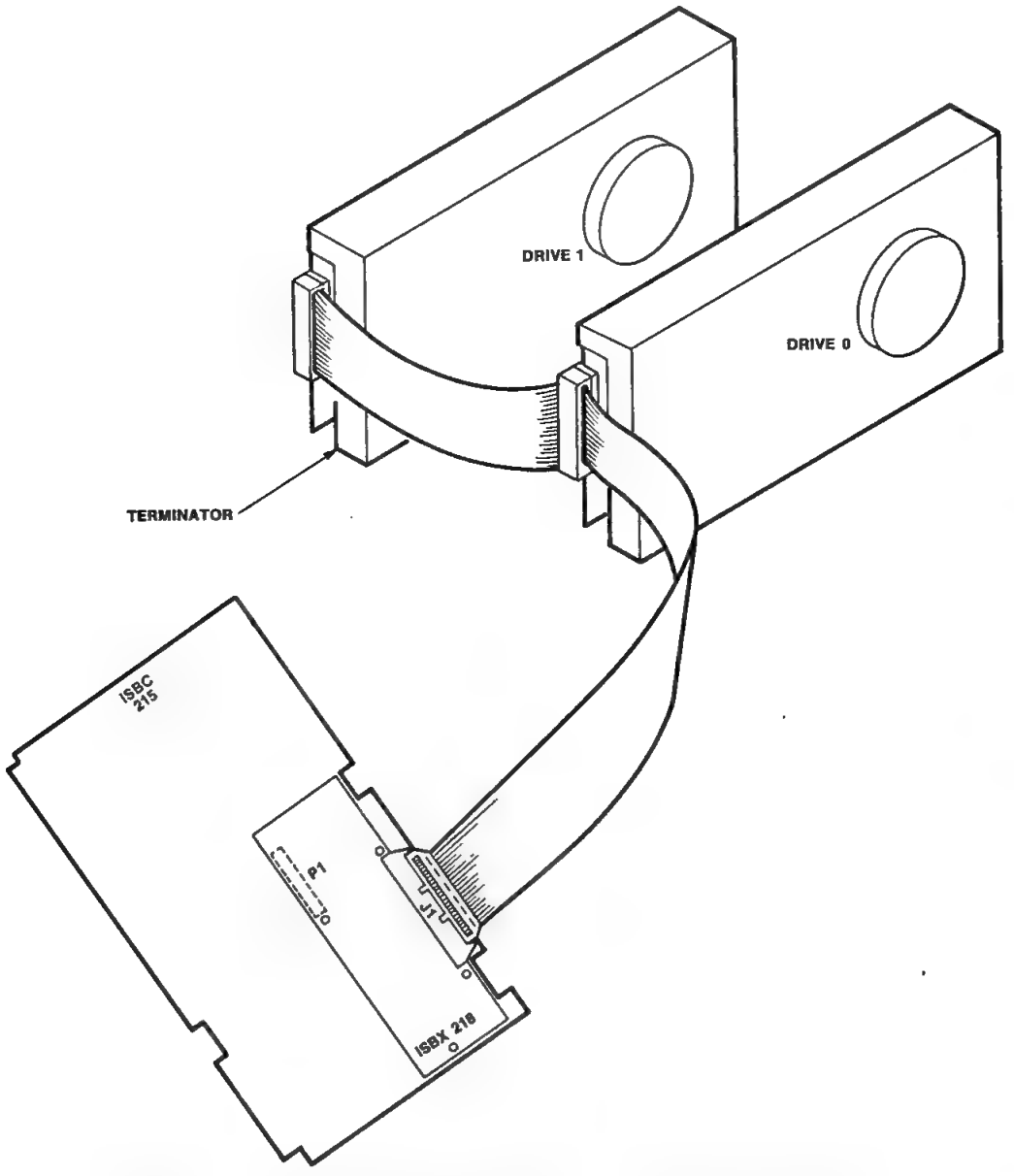


Figure A-5. Shugart SA850 Diskette Drive Interface Diagram

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